

# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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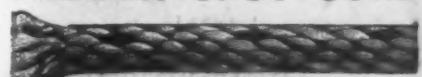


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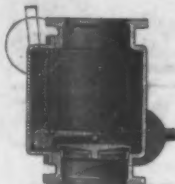


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# THE IRON AGE

THURSDAY, SEPTEMBER 22, 1904.

## A Forty-Passenger Automobile.

A sightseeing automobile which differs from those heretofore in use in that the seats are terraced so that each passenger has an unobstructed view has recently been built by the Fischer Motor Vehicle Company of Hoboken, N. J., for the New York Auto Transfer Company. The vehicle is shown in Fig. 1, and in size and seating capacity is probably the largest of its class that has ever been put into active service. There are eight rows of seats, each accommodating five passengers comfortably, or six if need be, so that the maximum seating capacity is 46, exclusive of the operator. Each row of seats is 5 inches higher than the one in front, and is made to open near its center, the last seat excepted, to facilitate the entering and leaving of passengers. The general dimensions of the automobile are: Length, 18 feet 6 inches; width, 7 feet 7 inches;

problem of driving a heavy truck or bus is much more involved than the driving of an ordinary light pleasure vehicle. With the latter, the sudden jump made in starting when the gears are engaged is absorbed without discomfort by the springs and the slipping of the wheels. This would not be permissible in a heavy machine, as it would shake the load and soon destroy the tires. It is then necessary to employ some power means which has greater elasticity than a gasoline motor, and steam and electricity are the only recourses. A steam driven vehicle has certain disadvantages, principally in complications attending the use of a boiler, and an all electric system requires the carrying of a very large storage battery, which is in danger of being over-discharged or of causing the vehicle to become stalled if the driver does not pay careful attention to the condition of the battery and his distance from a charging station. The advantages in

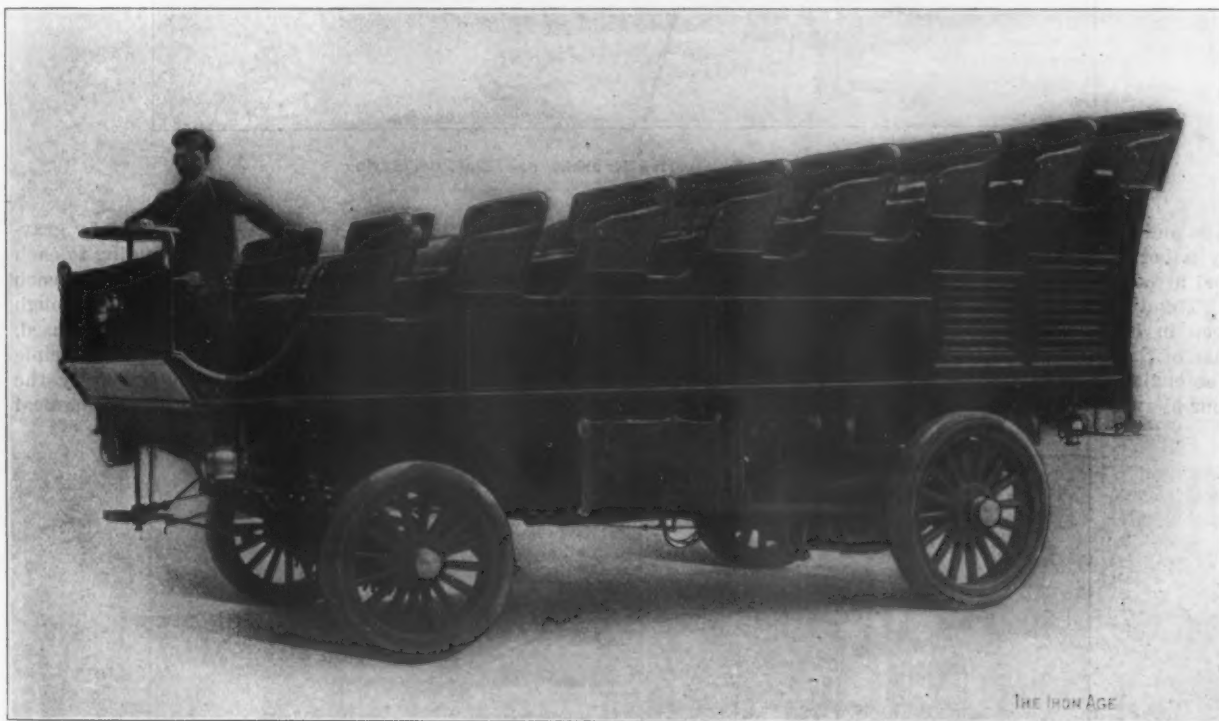


Fig. 1.—The New Terraced Automobile: 18 Feet 6 Inches Long, 7 Feet 7 Inches Wide; Weighs 13,000 Pounds Unloaded; Capacity, 40 to 46 Passengers.

wheel base, 10 feet 3 inches; gauge, 6 feet 5 inches; weight (empty), 13,000 pounds; speed, 10 miles per hour.

The power equipment consists of the Fischer combined gasoline and electric system, wherein a gasoline engine is used to drive a dynamo, and the latter to furnish current to motors geared to the rear wheels. A small storage battery is connected in multiple with the motors and the engine runs continuously. The storage battery thus serves as a reservoir of energy, being charged when the motors are consuming less than the full generated current, and discharging when the motor load exceeds the normal capacity of the dynamo. At first thought it may seem an uneconomical system, inasmuch as there is an undeniable loss of efficiency in the three transformations—namely, from the engine to the generator, from the generator to the storage battery, and finally from the storage battery to the motor. It must be remembered, however, that there are only two of these losses which are considerable, inasmuch as the storage battery handles only the balancing current, most of the electric power being transmitted direct from the dynamo to the motors. The disadvantages, however, are more than offset by the gains made in other directions. In the first place, the

the combination system are elasticity in starting; a control that has a greater range than is possible with change gearing and is more easily manipulated; the ability to run any distance, limited only by the capacity of the gasoline and water tanks; a storage battery which is light, its capacity being only that necessary to care for the unbalanced load, and which is never discharged below its efficient range, and last, and perhaps most important, the use of the gasoline engine at its most efficient speed, for it is well known that the economical performance of a gasoline engine is limited to but a small range.

The general construction of the chassis is similar to that of other heavy vehicles built by this company. The frame is built of channel steel, the wheels are of the wooden artillery type, with solid rubber tires, front wheels 36 inches in diameter by 6 inches tread, and rear, 42 inches in diameter by 7 inches tread. The front axle is of wrought iron, built on the bridge truss principle, giving the greatest strength for the amount of material used. The parts of the front axle, including the steering knuckle and springs, are shown in Fig. 2. The rear axle, shown in Figs. 3 and 4, consists of a diamond shaped steel frame, supporting two electric motors, each geared

with a double reduction to one-half of the divided live axle so that no differential gear is required. The gears are on the inner ends of the motor shaft, and are all inclosed in a single casing. The outer ends of the motor shafts carry drums for the brake mechanism. The whole forms a complete self contained driving unit, partly resting on the wheels and partly spring suspended from the body of the vehicle. The front springs are of the platform

magnetic flux travels. The contact breaker is placed in this gap, so that the spark is reduced by the effect of the magnetic blow-out, greatly prolonging the life of the contacts. As a precaution, two of these interrupters are placed on the machine, either one of which may be set in operation by the throwing over of a double throw switch, and when one fails to act there is always the other as a reserve.

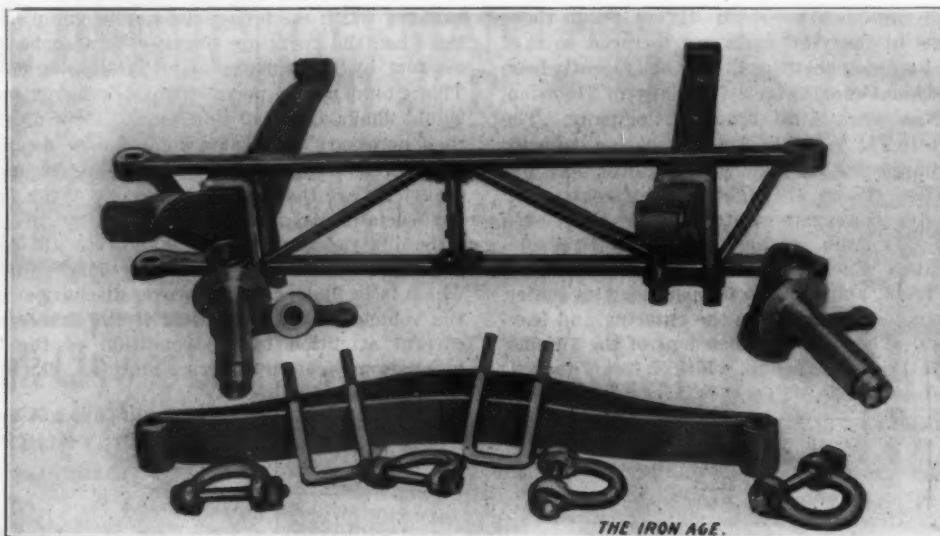


Fig. 2.—Front Axle, Steering Knuckles and Platform Spring.

type and the rear ones half elliptic. The steering is done by a horizontal hand wheel through a rack and pinion and a rod connecting to a knuckle arm.

The disposition of the parts of the machinery may be seen in Fig. 5, which shows a sectional elevation and plan of the vehicle. Fig. 6 shows the engine generator set. The engine, made under the company's own patents, has four  $5\frac{1}{2} \times 6\frac{1}{2}$  inch cylinders placed in horizontal opposed

The lubrication of the engine is accomplished by gravity through a system of small brass pipes running to each rubbing part. Instead of regulating the supply to each pipe by a needle valve, the constricted opening through which is always likely to clog, a novel feeder is used, which was also invented by Mr. Nilson. The principle of this feeder is shown in Fig. 7. Fundamentally the feeder consists of a brass drum, A, rotated by mechanical

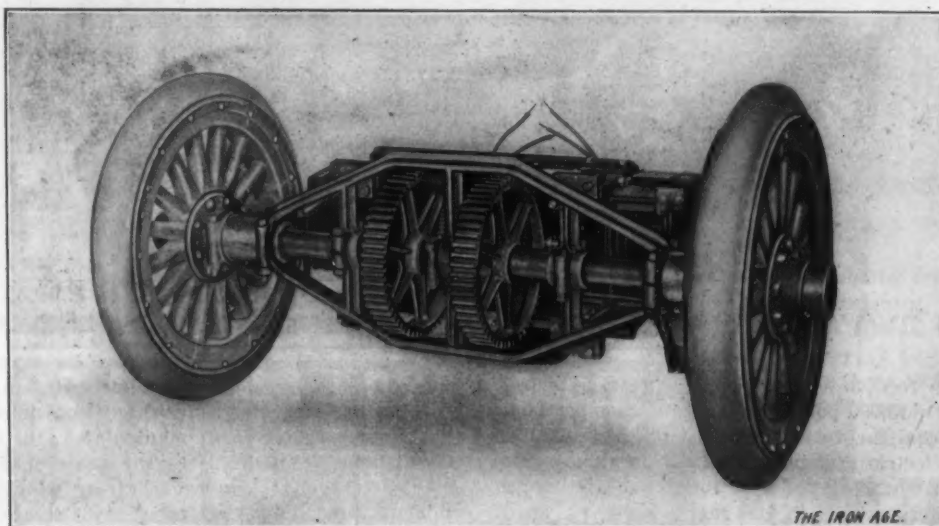


Fig. 3.—Rear Axle as Seen from Behind with Gear Case Removed.

pairs, and runs at 550 revolutions per minute. A jump spark igniter is used with an induction coil for each cylinder, the primary circuits of all being broken by a single vibrator. A rotary contact maker, or commutator, driven by a connection with the engine, directs the secondary current successively to the spark plugs of the four cylinders. The coils are placed as near the engine as possible for the reason that it is difficult to insulate the secondary wires. For the same reason four coils are used instead of one. The interrupter is placed near the operator's seat and is of a form embodying a novel idea patented by Lars Nilson, chief engineer of the company. The armature is in two pieces, with a gap between across which

means and dipping in a bath of lubricant. A stationary semicylindrical sheet, C, partly encircles the drum, and is held a certain distance from its surface by springs and spacing points. If the oil is heavy this limits the quantity taken up by adhesion to the drum, and if the oil is light assists in raising it by capillary attraction. Connected with the inlet of each of the oil pipes is a brass spring brush, E, which bears on the drum and lifts from it a certain quantity of the oil, depending upon the width of the tapered end of the finger. To increase the supply to any pipe a small piece is cut off from the brush to widen the end, and to decrease it the taper is sharpened.

The crank case of the engine is extended to form a



sub-base for a Sprague 10-kilowatt, 120-volt, shunt wound dynamo. An automatic magnetic throttle governs the engine, according to the demand of the motor, regardless of the speed of the vehicle. This throttle is connected with

tioned among the advantages of the combined system. It is not necessary to crank the engine by hand, or even for the operator to leave his seat in order to start it. By closing a switch the dynamo is caused to run as a motor,

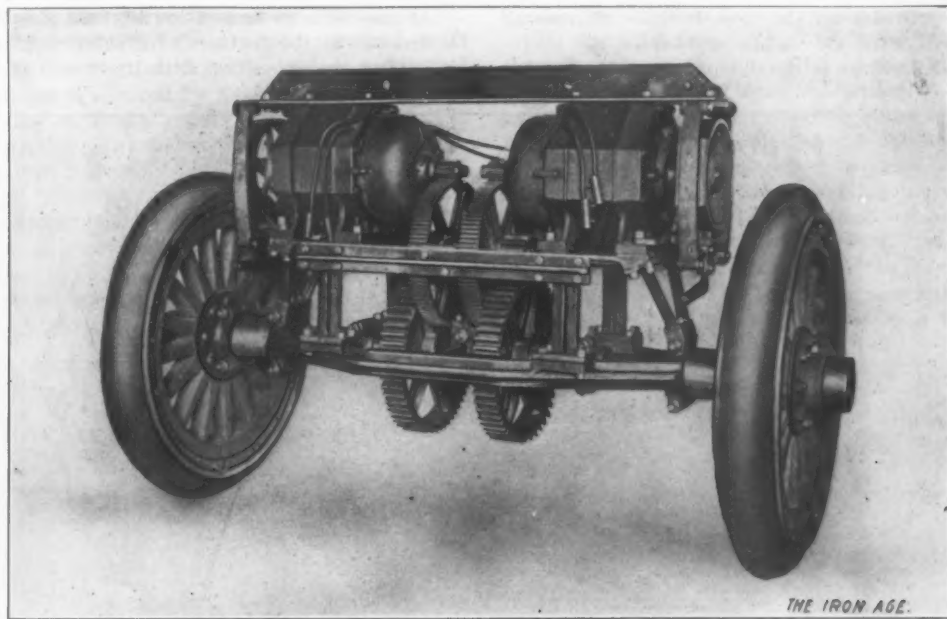


Fig. 4.—Rear Axle from Above, Showing Motors and Gearing.

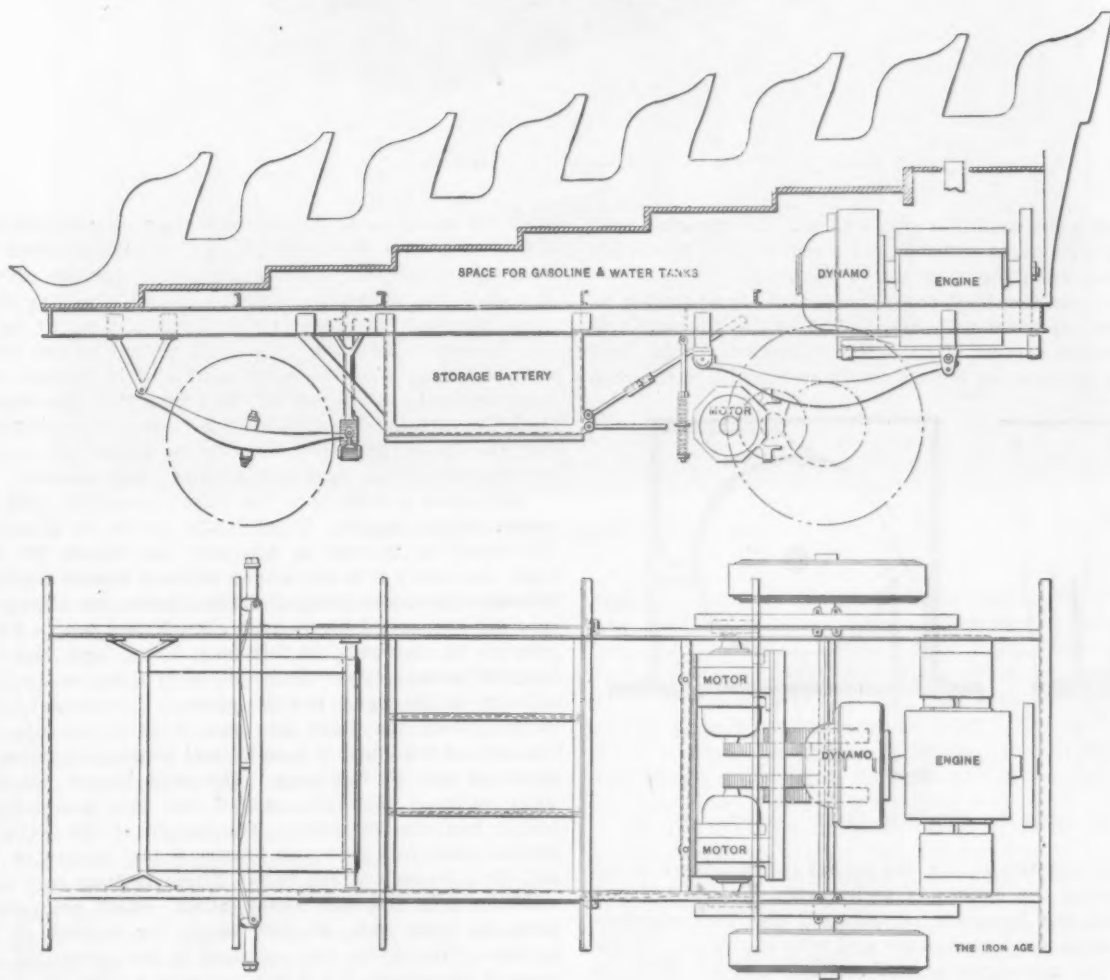


Fig. 5.—Elevation and Plan, Showing the Arrangement of the Parts.

the operator's speed controller, so that when on the off position the engine is throttled slightly, but not enough to stop it. As soon as the controller is moved to any of its running positions the magnetic device operates, drawing the throttle open. The arrangement for starting the engine is a unique feature, which should have been men-

tioned among the advantages of the combined system. It is not necessary to crank the engine by hand, or even for the operator to leave his seat in order to start it. By closing a switch the dynamo is caused to run as a motor,

The storage battery consists of 48 cells of chloride

accumulators, made by the Electric Storage Battery Company of Philadelphia, with a total capacity of 136 ampere hours at a three-hour rate of discharge. The motors are of Sprague make, series wound, of  $7\frac{1}{2}$  horsepower each, and will stand a 200 per cent. overload for a half hour, and 100 per cent. for an hour. Weston volt and ammeters are provided on the dash board. A two-way switch connected with the voltmeter enables the operator to read the pressure at the dynamo or at the battery

reference to revise the scale of wages. This conference will be held at an early date, when each side will appoint a conference committee.

### The Ferris Wheel.

At the Chicago Exposition of 1893 the Ferris Wheel formed one of the features of greatest engineering interest. After the exposition with its crowds of visitors was

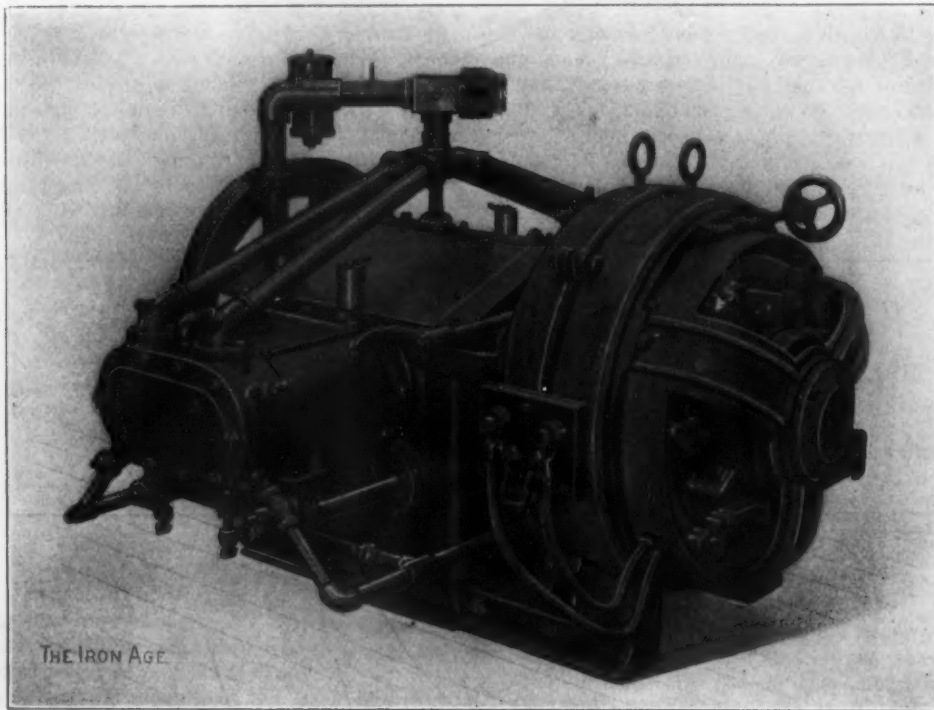


Fig. 6.—The Engine Generator Set.

to ascertain its condition of discharge. The gasoline tank holds 28 gallons, or sufficient for a run of 90 to 100 miles, depending upon the condition of the roads.

The controller is of the series-parallel type similar to that used on street railways, and gives five forward and two reverse speeds. With the controller on the first running position the motors are in series with each other

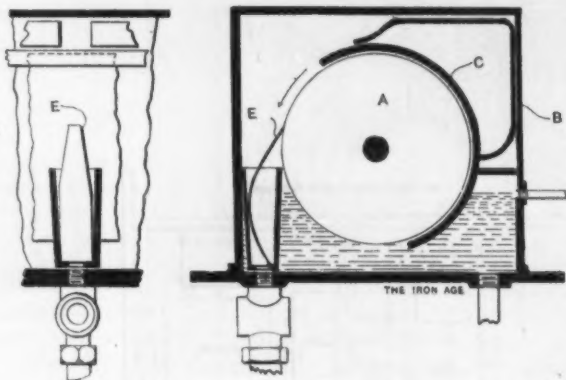


Fig. 7.—Details of the Oil Feeder.

and with a resistance; on the second the resistance is cut out, leaving the motors in series with one another; on the third, the fields are in multiple, and the armatures are in series with each other and with the fields; on the fourth, the armatures are in multiple and the fields in series with each other and with the armatures, and on the fifth, the motors are in multiple, with the field and armature of each in series. The two reverse speeds are obtained with the same connections used for the two slowest speeds, but with the current passed in the opposite direction through the windings.

The Manufacturers' Association of Pittsburgh has sent a request to the boiler makers' helpers for a con-

ference to revise the scale of wages. This conference will be held at an early date, when each side will appoint a conference committee.

over, the operation of the wheel became unprofitable and it was sold. The St. Louis Exposition has furnished another opportunity to profitably exploit it, and the present owners of the wheel, the Chicago House Wrecking Company, removed the wheel to St. Louis and set it up on the Exposition grounds. The total weight of the wheel and its fittings was some 4,200 tons, and 175 freight cars were required to transport it. So long a time has elapsed since the original description of the wheel was published that the following brief *résumé* of its design and principal dimensions will doubtless interest many readers:

The wheel is built upon the bicycle principle, with immense tension spokes, 2 and 15-16 inches in diameter. The wheel is 250 feet in diameter and stands 264 feet high. In reality it is two wheels securely braced together. Between the outer rims of these wheels the eleven-ton cars are suspended on  $\frac{1}{2}$ -inch pins, 6 feet long. These cars are 13 feet wide, 26 feet long, 9 feet high, and will carry 60 persons each. There are 36 of them, so the total capacity of the wheel is 2,160 persons. At several times in its history the wheel has been filled to its capacity. The axle of the wheel is a solid steel forging, 32 inches in diameter and 45 feet long. The solid bronze bearings upon which it rests are each 6 feet long and contain nearly two tons of metal. The weight of the wheel is carried upon two four-post towers, 6 feet square on top and 40 x 50 feet at the base. These in turn rest upon solid concrete and steel beam pillars, which are carried down to solid rock, 26 feet below the surface of the ground. The towers are anchored to the bottom of this mass of concrete by 2 x 6 inch eye-bars, so that the wheel is perfectly safe, even in the most violent storms. The side vibration of the wheel in an 80 mile an hour wind is less than  $\frac{1}{2}$  inch. The wheel is run by a double reversing engine with cylinders 30 x 48 inches, capable of developing 2000 horse-power. The power is applied through a series of cogs to a sprocket chain which engages wide cogs on the outside of each rim.

Two revolutions are given each passenger, and the time required is from 20 to 30 minutes.

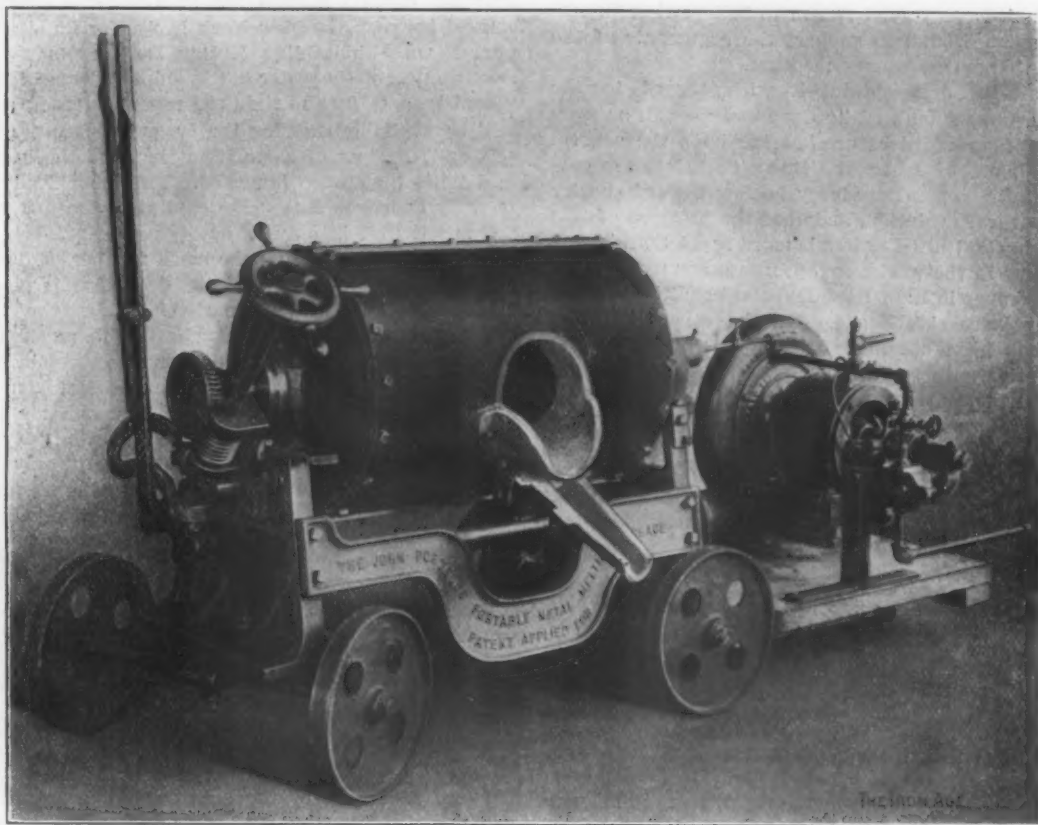


### The Porteous Portable Metal Melting Furnace.

A metal melting furnace in portable form is a thing that so far as is known has never been manufactured before. The one illustrated on this page is made by the John Porteous Mfg. Company, 525 Reading Road, Cincinnati, Ohio, and is claimed to have shown itself by tests to be a most economical and convenient furnace. It is intended primarily for foundry use in the making of light castings, but is adapted for various purposes requiring the melting of brass, copper, zinc, aluminum, tin, lead, steel, cast iron and malleable iron. Among its advantages are that it does away with crucibles, ladles and coke, oil or gas being the fuel, and that it may be handled with perfect comfort. It is commendable for special jobs wanted in a hurry, as a heat can be taken off every hour and there is no necessity of waiting for a cupola. Among its special uses are the burning of rail joints on railroads, the brazing of copper tubes or any other kind

withstand from 300 to 400 heats before it must be renewed. The two front wheels revolve on a ball bearing fifth wheel and the truck may be steered by a lever attached to the front wheels. It is propelled by a series of gear wheels or with a side rod, at the convenience of the operator, and is designed to run on a rail truck road laid on the foundry floor.

If oil is the fuel used it is forced into the furnace through an opening at one end of the shaft by a small rotary pump and the blast is afforded by a blower. If natural gas is used the procedure is the same as for any gas furnace, the gas entering through the hole in the shaft. Where electrical power is available the furnace is equipped with a motor for driving the fan and pump, but it may also be had with pulley instead for belt connection. The engraving shows an oil fed furnace, with motor drive. The suction pipe for the oil may be seen at the extreme right, leading to the rotary oil pump. The supply to the furnace is controlled by a valve, and any



The Porteous Portable Metal Melting Furnace.

of heavy copper work, softening asphalt and tempering and hardening steel.

When the metal is ready for pouring, the furnace, being mounted on a four-wheeled truck, may be conveyed to any part of the foundry and the metal poured from the lip shaped opening directly into the gate hole. The furnace is supported by two grooved trunnions rolling on the horizontal surfaces of two uprights. It may be rolled from side to side by a pilot wheel and worm gear, allowing a lateral movement of a 10 or 12 inch radius, and the spout may be quickly and easily adjusted to the gate hole by the long vertical lever. When the furnace has been poured it is recharged and run back and connected to the fuel supply. The fuel is either crude oil or natural gas. The time required to connect or disconnect the furnace is not over five seconds.

The furnaces are manufactured regularly in three sizes, of 300, 600 and 1000 pounds capacity, respectively, and larger sizes may be had on special order. It is simple in construction, positive in movement and has no delicate devices requiring frequent repairs. The shell is made of 5-16-inch plate steel and is divided lengthwise into two parts, bolted together on the sides and ends. The shell is lined with a layer of cement and fire brick to a thickness of about 4 inches. The lining is said to

surplus returns to the oil tank through an escape valve and an overflow pipe. The motor is on the same shaft with the fan and is geared to the pump. The oil pipe leads to the furnace through the elbow connecting the fan discharge with the furnace, and both may be disconnected by unscrewing a union joint. The hand wheel for propelling the furnace is on the opposite side from that shown and connects with the axle of the rear wheels through gears, which may be dimly seen in the figure.

To operate the furnace the motor is connected with a source of electric current and the furnace with the fuel supply by means of a union joint. The furnace is then fired by a lighted torch and the air and oil are turned on slowly. In a few seconds the oil is thoroughly ignited and the flame plays directly on the metal in the furnace. When the metal is at the required heat the air and oil are turned off and the furnace is disconnected and wheeled to the molds.

When the bricks at the top of the furnace become worn the barrel may be rolled over and the spout attached to the opposite side at an opening there provided, but normally covered with a circular plate. The plate is then placed over the old hole, after it has been plugged up with fire clay.

It is stated that a given quantity of metal may be

melted in this furnace at about one-quarter of the cost of melting the same quantity in crucibles, as a result of a saving in fuel and labor expense and a decreased loss of metal in melting. For softening asphalt pavement the furnace is turned downward so as to direct the flame upon the surface to be softened. For rail joint burning the truck is made to fit any gauge track, so that the metal can be poured directly upon the joint.

### The Eight-Hour Inquiry.

WASHINGTON, D. C., September 20, 1904.—The work of gathering data for the report of the Bureau of Labor upon the questions submitted by the Labor Committee of the House of Representatives as to the advisability of the enactment of the so called Gompers eight-hour bill is now progressing rapidly, and the matter will be in shape for final analysis before November 1. While it is too early to definitely forecast the conclusions of the Bureau, there is very good reason to believe that the report will not be found to support the arguments of the friends of this extraordinary measure.

From all the data obtainable with regard to the specific questions submitted by Congress, as well as from the great volume of literature bearing upon the general subject of hours of labor, the Bureau officials are convinced that the general tendency is now toward shorter hours by natural evolution, and that the progress of this movement in the United States is more rapid than in any other country in the world, taking into account the great variety of domestic industries and the conditions under which they were established. On the other hand, no evidence has been obtained by the Bureau indicating that legislation, either State or Federal, has in the long run assisted the movement. In isolated cases, and especially with reference to such police regulation of industries as the limiting of the hours of labor of women and children, the passage of laws has aided in reducing the length of the workday in certain industries, but in almost all cases, where the length of the work day has been cut down there has been either a decrease in wages paid per day or such an increase in the unit cost of output as to reduce consumption, and hence to diminish the demand for labor. The labor leaders appear to have ignored entirely the direct effect of the shorter work day, which increases the labor cost and diminishes the demand for the output. Under certain conditions when the demand is very great this labor cost may advance considerably without visible effect, but viewed broadly it appears that where the cost of production is materially increased by a reduction in the hours of labor, the result is a diminished demand that promptly affects the particular class of labor engaged in the industry.

#### Few Plants on Eight-Hour Basis.

The first series of schedules sent out by the bureau to manufacturers have been returned, and are now being collated. They include two classes of industries—namely, those now working on an eight-hour basis and those which have reduced the hours of labor, but are still working more than eight hours. Very few establishments have been found operating on an eight-hour basis outside the iron foundries, building trades, cigar factories and granite cutting concerns, and the data received from these industries are far from conclusive. A salient feature of the information received is the fact that even in those trades working eight hours there is no limit of overtime, and hence the experience of manufacturers and producers in these lines sheds no light upon the probable effect of the Gompers bill, which abolishes overtime and establishes a hard and fast eight-hour day, with a penalty upon the manufacturer for every minute he may permit one of his employees to work in excess of the stipulated time.

It has been decided to conduct the canvass of those concerns having Government contracts clearly not exempt under the terms of the Gompers bill, by employing special agents to visit the plants and obtain the desired data direct from the books. This work is now being pushed as rapidly as possible, and, as foreshadowed in this correspondence some weeks ago, the only concerns

included in the bureau's list are the shipbuilders, the armor plate makers and a few firms engaged in the production of heavy forgings for ordnance. To this list will probably be added a few manufacturers of heavy machinery and two or three concerns outside of shipyards that have from time to time taken contracts for the construction of dry docks. Careful examination of the testimony given before the House and Senate Labor committees since the Gompers bill was first presented has demonstrated to the bureau officials that it would be a waste of time to attempt to gather the opinions of the shipbuilders and other Government contractors referred to as to the desirability of the enactment of the Gompers bill. Nearly every prominent concern is already on record as strongly opposed to the measure, and the great majority have declared that if it should become a law they would be forced to abandon Government work.

#### The "Connecticut"—"Louisiana" Contest.

When the report is submitted to Congress it will probably contain a brief but interesting chapter on the contest between the New York Navy Yard and the Newport News Shipbuilding & Dry Dock Company in the construction of the sister battle ships "Connecticut" and "Louisiana." By the time the report is ready statistics will be available showing the progress of these two vessels and the cost of same from the time the keels were laid until they were launched. The labor leaders have recently endeavored to make capital of the fact that the "Connecticut" is only 3 or 4 per cent. behind the "Louisiana," figuring on the same number of days since the laying of the keel, and the deduction is made that this disproves the contention of shipbuilders that it would be impracticable to construct a battle ship under the Gompers bill. The fallacies in this argument are obvious. In the first place, both yards were expected to make such arrangements as would insure the completion of both vessels within the contract time, and no limit was placed upon the number of men to be employed, the only issue being the relative cost of the two ships. In the second place, while the New York yard has operated nominally on an eight-hour basis, overtime is allowed, and any emergency is regarded as sufficient excuse for employing a force of men for any reasonable period.

The statements with regard to the impracticability of the Gompers bill as applied to a shipyard, which were presented with much force by practical men in the employ of the Cramps, dealt almost exclusively with the difficulties that would follow the abolition of overtime, which, it was claimed would prove a tremendous handicap to the shipbuilder, especially during the operations which follow the launching of the ship, including installing the machinery and putting the armor and armament in place, when conditions of tide and weather frequently make it necessary to continue the work of certain gangs considerably beyond the ordinary limits. W. L. C.

**Wire Cables Adopted For New York's New "Manhattan" Bridge.**—By its approval of the plans of Bridge Commissioner Best, last Thursday, the Municipal Art Commission of New York settled the much mooted question of whether eye bar or wire cables should be used in the construction of the proposed Manhattan Bridge, which is to span the East River at a point between the Brooklyn and New East River bridges. The plans of Commissioner Best, which were approved by the commission, call for wire cables. Now that this controversy is terminated, advertisements for bids will be issued as soon as the specifications can be prepared.

Metal workers employed by the Link-Belt Machinery Company, Chicago, who had gone out on strike in sympathy with the machinists in May, decided last week, in defiance of the orders of the business agents, to return as individuals and make application for work. The superintendent of the plant informs us that a number of such men have already applied for their old jobs, but could not be employed inasmuch as their positions had long since been filled with nonunion men, who had become proficient in their work, and would be retained as long as they gave efficient service.



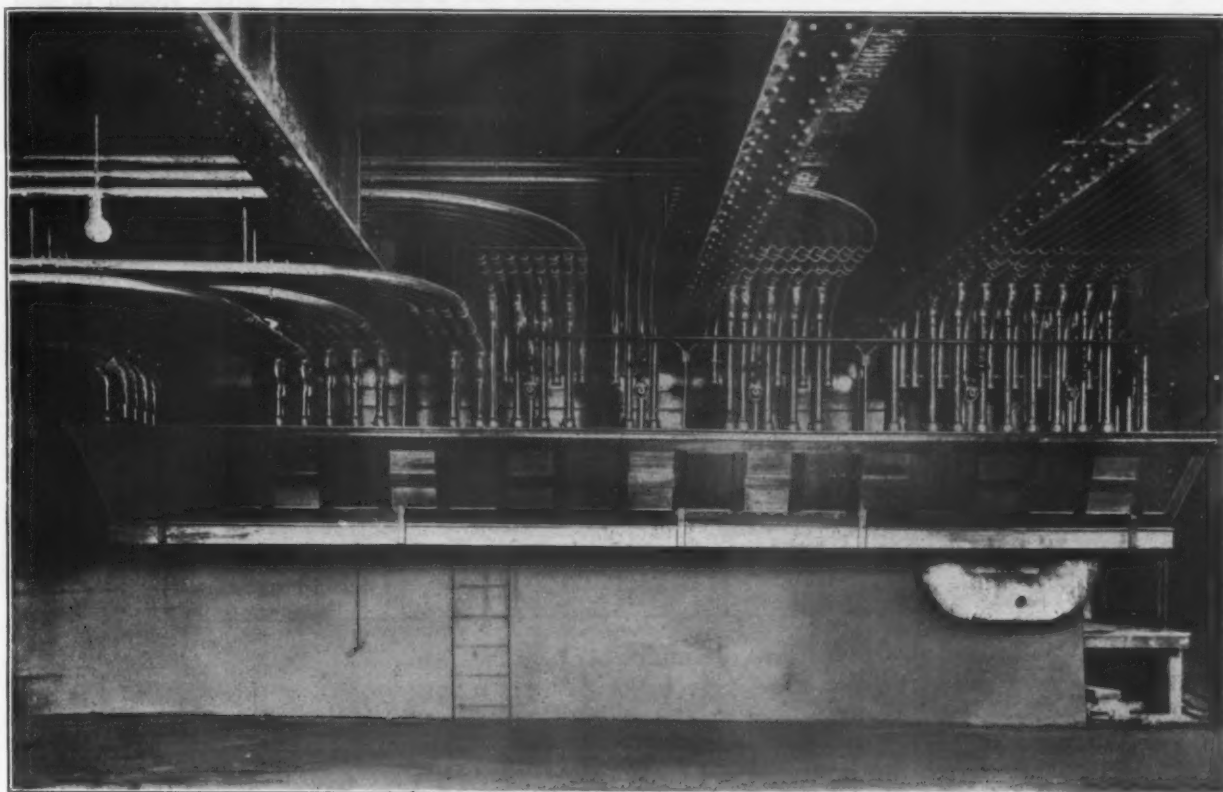
### An Improved System for Handling and Checking Baggage in the St. Louis Union Station.

To expedite the handling of baggage and express matter and do away with the danger and inconvenience to patrons incident to trucking baggage on passenger platforms and across tracks, a new system has been installed at the Union Station at St. Louis by the owner, the St. Louis Terminal Transfer Company. The train shed, which was 800 feet long, has been extended 150 feet, and a subway constructed underneath the tracks large enough to accommodate a great many teams and afford an underground storage warehouse for baggage. There are 32 tracks in the station, which are now served by 17 baggage elevators, the shafts for these being placed between each pair of tracks. From the baggage cars the trunks, &c., are lowered on these elevators to a transfer platform beneath, where they are either loaded on teams for de-

nished by three 40 horse-power, one 33 horse-power and one 7½ horse-power Westinghouse alternating current motors, each driving a Connellsville blower through a Morse rocker joint chain.

Westinghouse, Church, Kerr & Co. of Pittsburgh, Pa., were the general engineers for the entire baggage handling system, and the tube system was installed under the direction of Mr. Townsend, manager of the Chicago office of the Lamson Consolidated Store Service Company of Boston, Mass.

The Taylor-Wilson Mfg. Company of Pittsburgh has been incorporated with a capital of \$25,000. The new company is a corporation and will take over the business of Taylor-Wilson & Co., Limited, Grand avenue, Allegheny, Pa., manufacturers of machine welded gears and other machinery. The Taylor-Wilson Company is now building a large new plant at McKee's Rocks, Pittsburgh,



Underground Baggage Receiving Station, from Which the Checks Are Distributed through Pneumatic Tubes to the Transfer Stations.

livery about the city or in case of transfer are trucked to the foot of the elevator serving the proper outgoing track.

A pneumatic tube system has been installed for transferring baggage checks from the baggage room to the 35 separate transfer stations. When the passenger purchases his ticket he has only to step to the adjoining booth, where he secures a claim check for his baggage, and a corresponding check is sent by tube to the underground receiving station, where his baggage has meanwhile been taken. The check is then sent to the transfer station corresponding to the traveler's destination, as shown by his ticket. The accompanying half-tone shows a view of the receiving station from which the tubes radiate to the 35 underground transfer stations. The tube system was installed by the Lamson Pneumatic Service Company, and comprises some 8 miles of 3-inch brass tubing. It is capable of carrying 12,000 baggage checks per hour during the day and early evening turn when the work is heavy. Ordinarily, the cartridges are drawn through the tubes by vacuum, but during the lighter hours, late at night and early in the morning, the system is reversed so that the cartridges are driven to their destination by air under pressure, this arrangement being the most economical when the service is light. The necessary power is fur-

which the concern expects to occupy about January 1. It is stated that a rush order for 25,000 boxes of tin plate has been secured by the American Sheet & Tin Plate Company from the Japanese Government. The order will be filled at the Shenango Works of the American Sheet & Tin Plate Company at New Castle, Pa., and will be shipped out as fast as possible.

The Cuban Government has awarded the West End Rolling Mill Company & Chain Works, Lebanon, Pa., their annual contract for heavy chain cable for harbor use. This is a duplicate of a contract given to the West End Rolling Mill a year ago. This contract, with the one recently secured from the United States Government, Philippines, assure them steady work for some months in their chain department.

Sixty new fire proof cars have lately been put into commission in the subway of the Metropolitan Railway in Paris. In addition to the fire proof qualities, which have been severely tested, they are claimed to have great powers for resisting collision. They have seating accommodation for 74 passengers and room for 45 more standing.

### Automatic Lubrication of Rolling Mills.

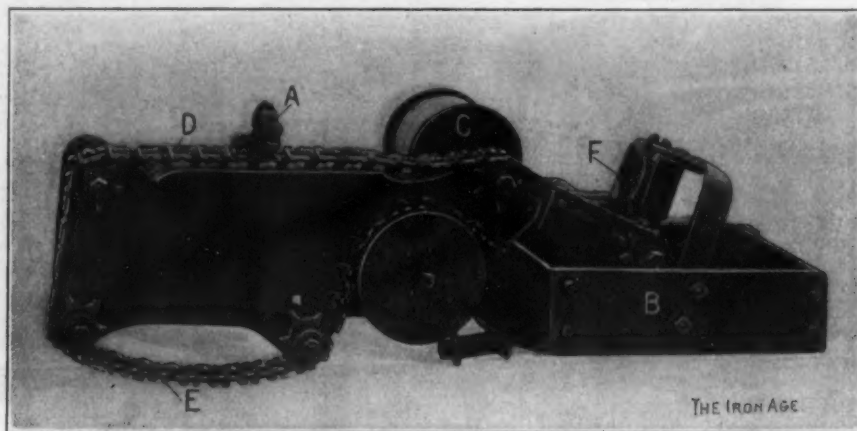
A company has recently been incorporated in St. Louis, Mo., known as the American Automatic Lubricating Company, to manufacture and sell a newly invented automatic swab greaser for rolling mills. The present practice among rolling mills is to grease the roll necks by hand, and it frequently happens, because of lack of skill or neglect of duty on the part of the greaser, that the necks get hot, resulting in the breaking of the rolls. Another difficulty frequently attending hand greasing is that grease is apt to seep in between the rolls, causing plates or sheets to pinch, damaging both rolls and product.

The above named company believes that it has overcome these difficulties by means of the mechanical apparatus illustrated herewith. It consists of a swab, A, attached to an endless chain, which passes through a grease box, B. The chain is driven by a sprocket and pulley at C, and is supported by other sprockets so that it will pass between the two upper and two lower roll necks at D and E, greasing both. A wiper is arranged above the grease box, at F, to remove surplus grease from the swab. It is stated that each set of rolls in a rolling mill requires 200 pounds of grease in 24 hours, when lubricated by hand, while this device gives perfect lubri-

1400 degrees F., the tuyere pipes were, of course, generally bright red; but it was noted occasionally that only two or three of the six tuyeres were so, the others being black, showing that nearly all the blast was passing through the red hot ones. By partially closing the valves in the tuyere stocks of the hotter ones, the others could be reddened, and the blast thereby more evenly distributed.

Subsequently a direct experiment showed that the volume of blast which was entering the furnace through 75 square inches of total tuyere area would pass out into the open air through 30 square inches at the same pressure, providing that the resistance was in the stock, and not in the tuyere. Probably this condition exists approximately at all blast furnaces. Many years ago John M. Hartman invented a device to show at a glance the distribution of the blast. As I remember it, it throttled the blast at each tuyere stock, thus maintaining a slightly higher pressure in the bustle windpipe than in the furnace, so that a blast pressure gauge, applied to each tuyere below the throttling diaphragm, would show the pressure in each tuyere. If it was equal to the bustle pipe pressure, it indicated an obstruction in the zone of that particular tuyere.

While it is easy to demonstrate blast wandering, the remedy is not so apparent. Maintaining a considerably



The American Swab Greaser for Rolling Mills.

cation with 80 pounds of grease in the same period. The bearings are said to be kept perfectly cool by this means, and at the same time surplus grease is prevented from finding its way onto the rolls, where it is likely to injure the plate. Herrick J. Gray, general manager of the company, has his office in the Commercial Building, St. Louis.

### Blast Wandering in Furnaces.

In a paper on "Special Forms of Blast Furnace Charging Apparatus," read before the Lake Superior meeting of the American Institute of Mining Engineers, T. F. Witherbee of Durango, Mexico, says:

It is currently reported that the modern large furnaces (from 90 feet up) have not proved very satisfactory, so far as regularity of working and fuel economy are concerned. In the West several have been blown out, after a few weeks' run, for decapitation and other changes, and the manager of one of the largest groups of furnaces in the United States predicted that the two which his company had under construction would not surpass the stacks 85 x 18 feet in size, except in quantity of product. The performance of these furnaces has more than confirmed his judgment, since they have never consumed less than 2000 pounds of fuel per ton of iron. It seems incredible that an addition of a foot or two to bosh diameter and 15 or 20 feet to height should be attended with such unsatisfactory results as are reported. One of my correspondents attributes this experience to a "wandering" of the blast, which is very possible, since the conditions for such a wandering are provided by the (from the one point of view) excessive tuyere area.

At an anthracite furnace, with blast heated to about

higher pressure in the bustle pipe may tend to remedy the evil, but so long as the method of charging keeps the center relatively more open, it will not be practicable to reduce the tuyere area; for, in such a case, the open center would be burned out, and the most serious of all blast furnace derangements, a ring scaffold, would be set up, with its accompanying dust throwing, slips and so called explosions.

Perhaps any defects in working, which may have been shown by the "Jumbo" furnaces, are due, not to the size of the stacks, but to the way in which the materials, including the blast, have been distributed. If their reported fuel consumption could be brought down to the best records of the smaller furnaces, it would represent a saving of over \$100,000 per annum for each furnace—a sum of sufficient importance to justify the slightly increased complication of the charging apparatus.

It will be a surprise if the monster Buffalo furnaces do not even surpass this fuel economy, not on account of any extra superheated blast that may be at their command, but by reason of their improved charging apparatus, which, to my mind, shows a step in the right direction.

It is to be understood that whatever reference has been made to large furnaces applies to a few specific cases, reported to me, which may not be typical ones. Moreover, in these cases, fuel economy may have been sacrificed for quantity of product, as is sometimes intentionally done for good commercial reasons.

The main purpose of this paper is to present the suggestion that better results in running might be had by charging nearer to the center, so as to have a more resistant column of materials there to blow against,



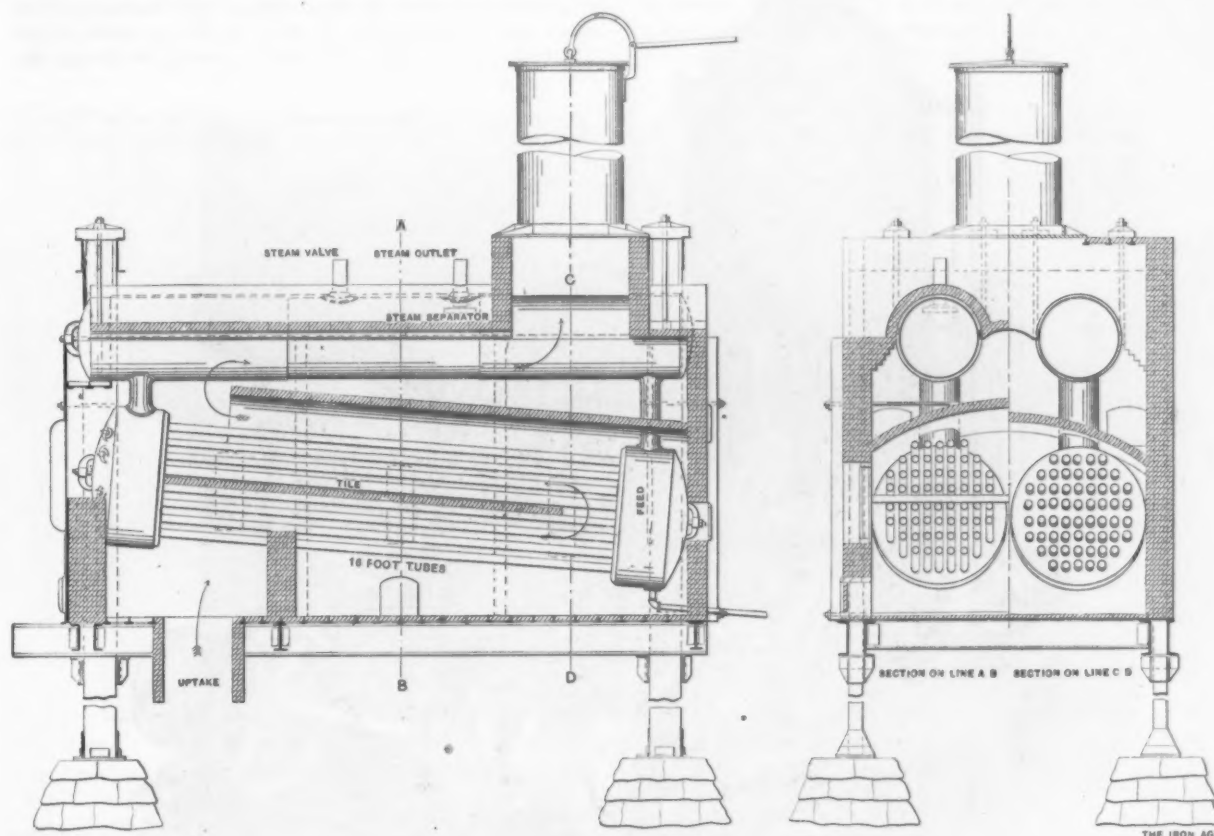
thereby enabling the reduction of the tuyere area enough to minimize blast wandering and its train of evils. As the matter now stands, we are obliged to use, with large bells, tuyeres from 50 to 60 per cent. too large, and thus practically to surrender all control of the blast at the bustle pipe, from which it can enter the furnace through any tuyeres offering a relatively smaller resistance.

### Wood's Improved Waste Heat Water Tube Boiler.

The feasibility of utilizing the waste heat from blast furnaces in the production of steam has been demonstrated by the many more or less successful attempts which have been made. Usually a boiler of some standard type is selected and modified in its setting and connections to adapt it to the conditions of such special service, though the result is often a somewhat cumbersome outfit. In seeking for improvements in the design

In this boiler the water circulation is uninterrupted, as provision is made for the passing of the whole volume of water at unchecked speed, no matter how rapid it may be. Half of the tubes convey the hotter ascending current while the other half return the cooler descending current. The first and most intense heat strikes the lower half of the first bank of tubes and expands the water, which rises to the top, where the commingled steam escapes. This increases the density of the water, which then descends through the second bank of tubes back to the first, and thus the circulation continues indefinitely.

The manner of introducing the feed water also tends to accelerate the movement. The feed pipe passes through the center of the steam drum and down the rear neck, ending at a sufficient height in the rear header to avoid disturbing or agitating the sediment. It cools the surrounding water, increasing the difference in specific gravity of the columns of water. Most of the particles



Wood's Water Tube Boiler as Arranged to Use the Waste Heat From a Blast Furnace.

of an apparatus especially intended for this class of work the first aim naturally would be to put it in a more compact form. This has been done in the boiler recently patented by John Wood, Jr., of Conshohocken, Pa., and manufactured by a company bearing the inventor's name, having its main office in the Betz Building, in Philadelphia, Pa. It places a large amount of power in a small space compared with the old type of boiler, and particular attention is called to the simple construction and the accessibility, both externally and internally, for cleaning.

The boilers are swung over the furnace from an iron frame of rolled I-beams and channels. They are independent of the brick work, making a strong, durable structure in which no cast iron is used. The waste products of the blast furnace pass through an uptake entering the combustion chamber at the front end of the boiler, thence passing among and around the lower bank of tubes, then the upper bank, and finally under the drum to the stack, which is placed at the rear. A fire brick tile partition separates the two banks of tubes and extends to within 3 feet of the rear tube heads. Similarly a fire brick arch is placed over the upper bank to within 3 feet of the front tube heads. The stack may be placed on top of the setting, as shown in the illustration, or at any other convenient location and connected by a flue.

held in suspension are, by reason of the heated state of the water, of so much greater specific gravity that they fall with the down currents and are deposited in the rear drum at the lowest point of the boiler, where the blow-off is connected.

The accessibility of all parts through hand holes or man holes permits the replacing of a tube at little expense and facilitates thorough inspecting.

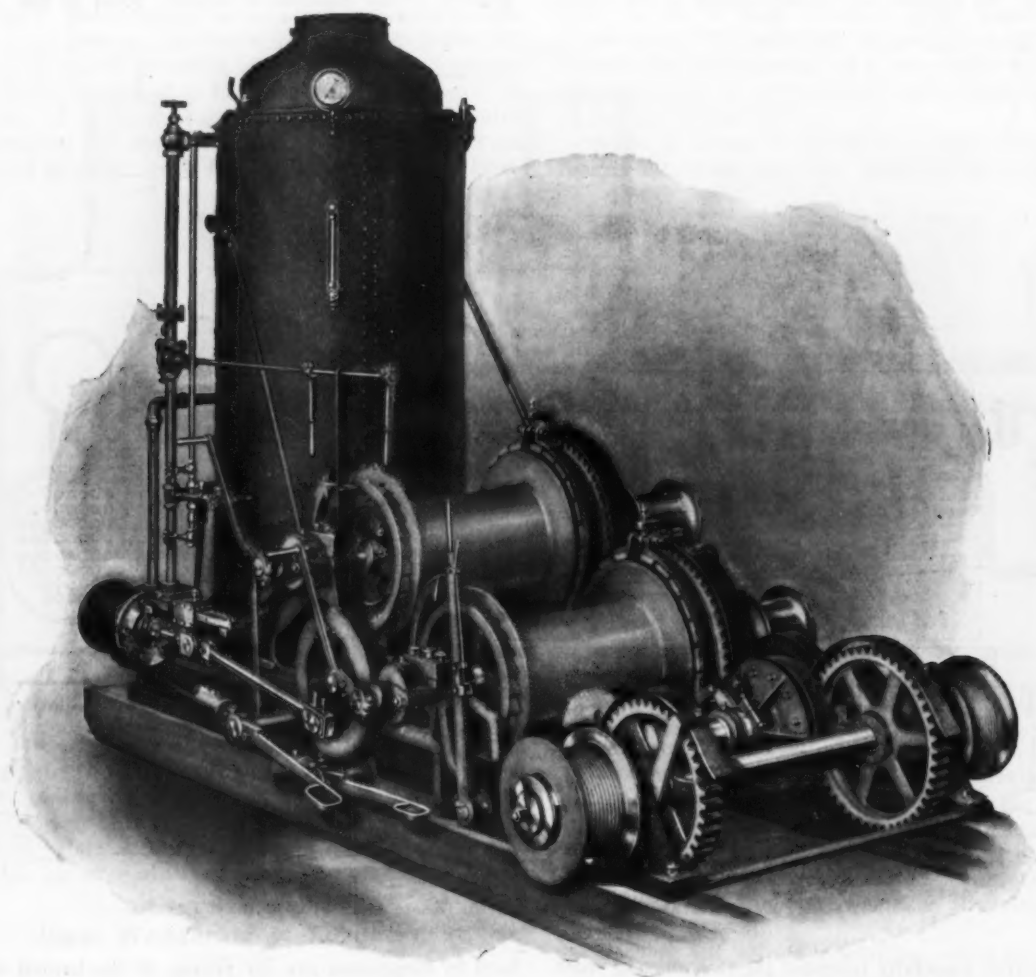
The accompanying illustration shows two boilers suspended over one furnace. This is the practice where there is a large amount of waste heat, such as is given off by tube welding and blast furnaces. They may be set singly where there is less available heat, or may be mounted in either way for direct firing. In the latter form the boiler is practically the same as the Wood's water tube safety boiler, which has been built for many years. The principal advantages claimed for both types are that all parts are readily accessible through hand holes or man holes, permitting the replacing of a tube at little expense and facilitating thorough inspecting; that there are no bent tubes or tubes of different lengths, and no parts of cast iron. There is only one metal used, open hearth steel, consequently strains due to unequal expansion are eliminated, and there are no circulating pipes outside of the brick work where the steam may condense.

### The New Lidgerwood Derrick Swinging Gear.

For swinging the boom of an ordinary derrick simultaneously with the raising of the boom and the hoisting of the load, three different types of gear have already been put upon the market by the Lidgerwood Mfg. Company of New York City. The illustration on this page shows a new one, recently designed, which is a marked improvement over its predecessors. The new apparatus consists of a drum shaft carrying two gear wheels and two drums, and a friction shaft carrying two frictions and pinions. The friction shaft is mounted on side stands, and the whole is tied together underneath by two recessed flat steel braces, making an independent apparatus, which is mounted on an extension of the engine skids, and fastened to the front ends of the engine

The frictions are applied by means of nuts traveling on composition sleeves having screw threads which are mounted on the friction shaft, and attached by suitable connections to an auxiliary shaft carrying the vertical operating lever. When this lever is in a central or vertical position neither friction is engaged. Moving it forward causes the nuts to travel on their screws, pushing one friction cone into engagement and releasing the other, and moving the lever back causes the reverse to take place. In this simple and effective manner one lever controls the swinging of the boom. The friction cones are of a special type of great holding power, and can readily be replaced when worn without interfering with the main parts of the apparatus.

To take up the slack due to the stretching of the rope, one of the swinging drums is loose on the shaft, but prevented from turning by means of a collar keyed to the



Lidgerwood Standard Double Friction Drum Engine and Boiler Equipped with No. 4 Boom Swinging Gear.

bed plate. If preferred, the engine bed plate may be extended and the swinging gear mounted upon it.

The friction shaft is driven by a pinion on the forward drum shaft next to the winch head. This meshes with an idler, which, in turn, drives a gear wheel keyed fast to the outer end of the friction shaft. There are two cone frictions on the friction shaft, the male parts carrying the friction woods, being mounted on the shaft with feather keys, and the female parts being cast with pinions and mounted loosely on the shaft. The pinion of one drives a gear on the drum shaft, revolving it in one direction, while the pinion of the other drives the shaft in the opposite direction through an idler pinion. The drums are spirally grooved, and the ropes wind over on one drum and under on the other. When one of the frictions is engaged the rope is wound up on one drum and unwound on the other drum, and when the other friction is engaged the reverse occurs. The ropes are attached to the bull wheel of the derrick to swing it in either direction.

shaft on which are lugs or projections fitting into corresponding recesses in the drum. By loosening the collar and moving it back the drum may be revolved until the rope is tight. The collar is then moved back into place and secured. Placing the drum outside of the bearings keeps the ropes leading to the bull wheel out of the way of the hoisting and boom lines.

The No. 4 swinging gear is made on the duplicate part system, and all parts are easy to get at. It occupies a small amount of space, does not add much to the weight of the engine, can be operated easily and quickly, and is adapted for severe service. The apparatus can be placed upon any of the Lidgerwood standard double drum hoisting engines, and is a most valuable addition, as it increases the working capacity of a derrick by doing away with the laborious, slow and expensive method of swinging the boom by hand. The Lidgerwood Mfg. Company is showing this new No. 4 swinging gear in Machinery Hall, at the St. Louis Exposition, where it is attracting considerable attention.



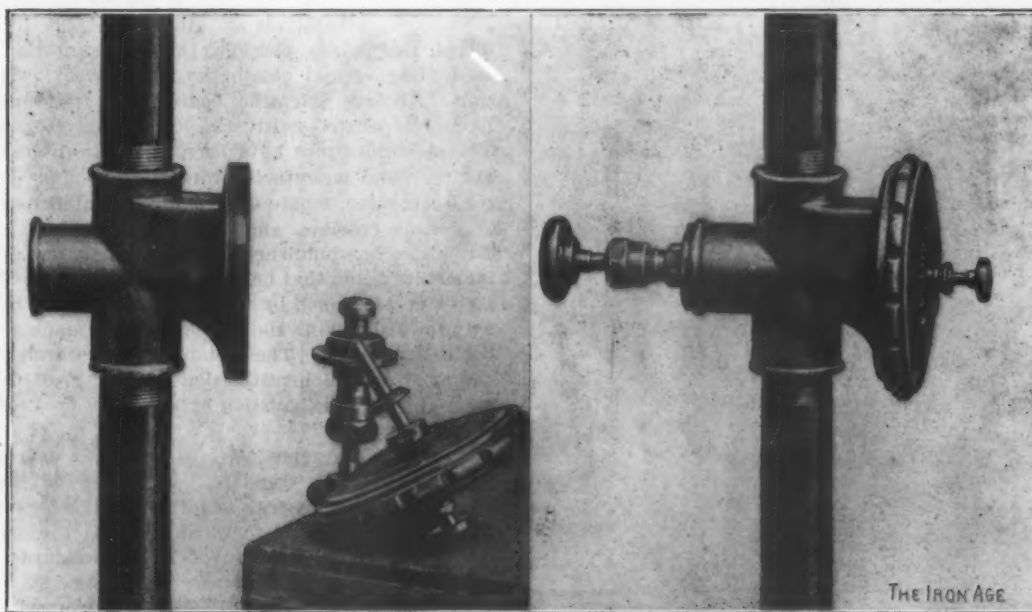
### The Dunham Low Pressure Steam Trap.

The operation of the Dunham steam trap depends upon a principle radically different from that of the ordinary form of steam trap, as it does not use floats, springs, levers, pots or buckets. The valve stem is directly connected to a hollow phosphor bronze diaphragm containing a volatile fluid, which expands and contracts the walls as the temperature varies. The traps act instantly, due to the fact that only a small quantity of fluid is placed in the diaphragm, and any change in temperature causes it either to flash into vapor, developing a pressure which closes the valve, or to condense, creating a vacuum which draws it open. The fact that the valve remains open when not in use makes it a desirable one for heating work, as all water and air will then be discharged from the system before the steam reaches the trap and closes it. Owing to its small size, it may be used in places where a bulky trap could not be. It may be adjusted to discharge continuously or intermittently, as desired. The latter arrangement is preferable on services discharging into a closed heater or tank, as the clicking of the valve, which can be plainly heard from the outside, indicates

opposite side of the cover. This being opened occasionally keeps the trap thoroughly cleaned of oil or substances that might otherwise collect on such low pressure service. It is peculiarly adapted for application to oil separators and is thoroughly reliable for this class of work.

The low pressure steam trap is made in four sizes, having inlets and outlets  $\frac{3}{4}$ , 1,  $1\frac{1}{4}$  and  $1\frac{1}{2}$  inches, respectively. The smallest trap has a capacity for draining 3500 linear feet of 1-inch pipe, or will care for 1166 square feet of radiating surface. The largest size has a capacity for draining 30,500 linear feet of 1-inch pipe and will care for 10,166 square feet of radiating surface.

Two styles of this trap are in use in the service power plant at the St. Louis Exposition—namely, the low pressure, with by-pass, and the standard, the latter operating upon a pressure of 150 pounds above atmospheric. A distinguishing feature of these traps is that they will discharge under varying pressure or against back pressure without readjustment. The standard trap has a balanced valve and, if desired, the low pressure trap may also be so fitted by eliminating the by-pass feature. This increases the capacity and allows the trap to work



The Dunham Low Pressure Steam Trap with Parts Removed and Assembled.

whether or not the trap is working properly. The trap is admirably adapted to care for sudden rushes of water, as it will open wide instantaneously and close with equal rapidity. It is self cleaning and in ordinary service will not become gummed, making it likely to stick. The material throughout is of phosphor bronze, which has excellent wearing qualities and is unaffected by alkaline or acid waters, such as corrode iron. Special machines are used in the manufacture of the trap, making the parts of standard size, so that they are interchangeable. The diaphragm is formed of two sheets of bronze brazed together at their edges. Under ordinary conditions one will last for many years, but in case of any disorder it may be quickly removed and a new one substituted.

The ease with which the trap may be inspected is remarkable. No pipe connections need be broken. The cover may be screwed off easily by hand after first cooling it by the application of water. The diaphragm valves are then free to be removed. The valve seat may be ground without removing the trap from its position on the pipe by placing an ordinary brace over the end of the valve stem and revolving it until the valve is perfectly tight, as will be indicated by the bright surfaces on each face.

The low pressure trap is intended for heating plants especially, as it will automatically operate upon pressures ranging from a vacuum to 25 pounds. It has a by-pass feature, the valve being controlled by the handle on the

equally well on high or low pressure steam, as very little force is then necessary to move the valve.

The traps are made by the C. A. Dunham Company, Marshalltown, Iowa.

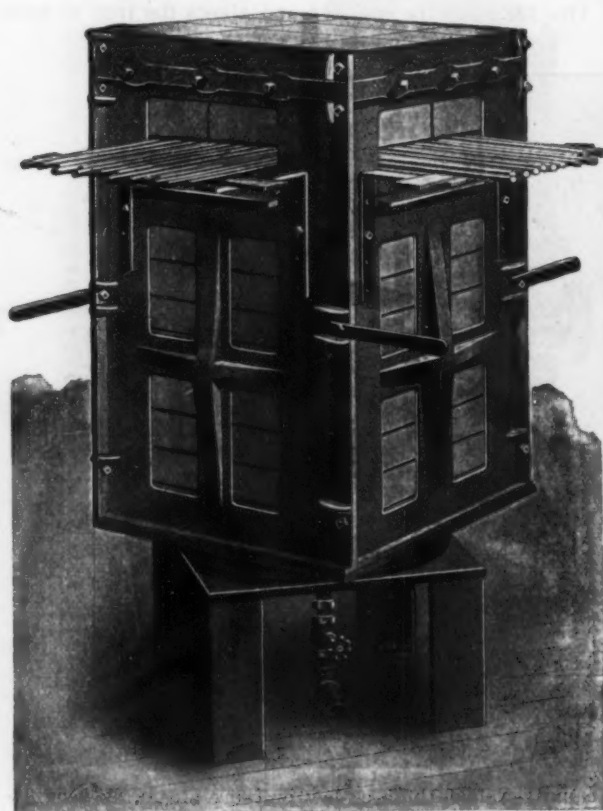
An interesting heat storage system has been installed in the London power station of the Kensington & Knightsbridge Company for increasing the boiler capacity during the period of the "peak" load. Each of the boilers is of the water tube type and capable of evaporating 12,900 pounds of water per hour. The thermal storage vessels are placed directly above the steam and water drums, and are about 22 feet long, and 54 inches in diameter. During times of light load the vessel is full of water, which is warmed by means of coils of live steam. When the heavy load comes on the feed from the pumps is stopped, and the boilers are fed from the hot water in the storage tanks.

The Portsmouth Steel Company, Portsmouth, Ohio, recently made a slight readjustment in wages of its employees, the men accepting a small reduction in wages. The open hearth plant of this company is now in full operation.

The Aurora, Elgin & Chicago Interurban Electric line has added a buffet motor car to its equipment, serving meals *en route*. It is capable of running at over 60 miles an hour.

### The Gorham Revolving Forge Furnace.

A furnace burning either oil or gas, and specially suitable for use in connection with bolt headers or forging machines for heating bolt blanks, wheel spokes and similar forgings, has recently been placed on the market by the National Machinery Company of Tiffin, Ohio. This is known as the Gorham revolving forge furnace and is shown in the accompanying illustration. In some respects it resembles a revolving book case. It is mounted on a vertical axis and turns very easily on a ball bearing base. Work may be introduced at any or all four sides, giving the machine an extra large capacity for the floor space occupied. Only one side of the furnace faces the operator at a time, so that the discomfort from the heat radiated is slight. It is claimed to be more economical in the use of fuel than a horizontal furnace of equal capacity, as the irons to be heated are placed advantageously where the hot gases concentrate and the heat is most intense. The heating effect is uniform, as the sides



The Gorham Revolving Forge Furnace.

are practically equidistant from the burner and will heat at the same rate of speed. The furnace is lined on the top and sides with commercial size 9-inch fire brick, and no special molded tile is required.

It is operated with either low or high pressure burners, the first requiring an air blast under a pressure of about 8 ounces per square inch and the other a blast at 15 pounds or more per square inch. The latter is recommended as being the most convenient and economical. The burner is attached to the base of the furnace and is vertical and stationary, requiring no swivel joints. The air and oil are emitted in the form of a spray from the burner, passing through a flue at the bottom of the chamber, and, after striking against and passing a baffle plate, are ignited. A few vent holes are provided at the top of the furnace, but there is no occasion to use a chimney, as the combustion is practically perfect and little gas escapes. There are, of course, openings in the sides of the heating chamber made by leaving suitable slots between the fire brick to admit the material to be heated. Lighting and slag holes are also provided. The arrangement of the interior is such that slag is prevented from flowing into and clogging the burner flue.

The capacity of a machine of this sort is rather indefinite, but it is stated to have an approximate output per hour of 400 1-inch, 700  $\frac{3}{4}$ -inch or 1000  $\frac{1}{2}$ -inch blanks heated for a distance of three diameters from the end. The machine occupies a floor space of 21 x 21 inches, is 4 feet high and weighs complete with lining about 1400 pounds.

### The British Engineering Standards Committee.

A meeting of Committee A of the American Society for Testing Materials, on Standard Specifications for Iron and Steel, was held on the 17th of September at the house of the American Society of Civil Engineers for the purpose of meeting Leslie S. Robertson, secretary of the Engineering Standards Committee of Great Britain; Dr. Charles B. Dudley, president of the American Society for Testing Materials, being in the chair.

The English committee was first formed at the instigation of the Council of the Institution of Civil Engineers, to consider the advisability of standardizing rolled sections. The work of the committee gradually grew in scope and importance, and various new subjects were added from time to time. The committees are so constituted as to include representatives of all the various interests affected, and, where possible, this representation has been secured by official nomination and not by private selection. Various scientific bodies and trade associations have co-operated with the committee in their work. These specifications have been carefully discussed by the engineer and manufacturer meeting around the table of the Institution, where any conflicting interests have been, as far as possible, amicably harmonized. The English committee has published several reports, one of the most important being that on "Standard Test Pieces." The test pieces decided upon by the committee appear to go a long way toward solving the difficulties surrounding this much debated question. The test pieces were arrived at after the most careful investigation by several of the committees, and after exhaustive experiments by Professor Unwin and others.

At the conference various speakers expressed their approval of these standard test pieces and their conviction that their general adoption in this country would mark a distinct step forward. It was the sense of the meeting that substitution of these standards for those now prevailing in this country was desirable.

It appears from Mr. Robertson's remarks that the British Standards Committee have a large amount of valuable work in hand, and the committee is supported by the British Government and the five leading technical societies in Great Britain. The committee is proceeding on lines quite similar to those followed by the American Society for Testing Materials. Both recognize the desirability of according representation on their committees to all parties in interest, including the manufacturers. The work is distributed among numerous subcommittees, whose reports are submitted to the parent committee for revision and adoption.

Mr. Robertson is expected to meet members of several of the committees of the American Railway Engineering Maintenance and Way Association, engaged on similar subjects, at a special meeting in Chicago, on September 29. The discussion of the general subject of standardization of methods of testing and of specifications governing the materials of construction will be continued at the International Engineering Congress in St. Louis, October 3 to 8.

**A Bar Mill Record.**—The National Rolling Mill Company of Vincennes, Ind., has been doing some excellent work for a considerable period. The records, however, were broken on Friday, September 9, when the day crew on the 10-inch mill of the company charged 118,450 pounds, which finished 100,050 pounds. They turned the mill over to the night crew on time. The night turn charged 120,200 pounds and finished 100,155 pounds, a record which so far as is known has never been exceeded in 24 hours on a 10-inch guide mill. This fast work was done while running on a  $1\frac{1}{4}$  inch rounds.



### The Willey Electrically Driven Drills.

In *The Iron Age* of July 21 and September 1 there were illustrated a few representatives of a new line of electrically driven tools which has been brought out by James Clark, Jr., & Co., Louisville, Ky. The first article referred to a radial drill and the other to three different forms of grinders. The illustrations herewith show three styles of drills, Figs. 1 and 3 being sensitive drills and Fig. 2 an upright 22½-inch drill.

The driving motor and control on the upright drill are incorporated in the column of the machine. The motor carries a bevel pinion engaging a bevel gear on the spindle, driving the latter directly for high speeds and through a back gear, located above, for slow speeds. Nine speeds are possible in the motor, this range being

drill holes up to ¾ inch in diameter. The spindle is of tool steel, is counterbalanced by a spring and is provided with a ball thrust bearing. The table is counterbalanced by a weight in the column and can be swung around out of the way when desired. As a convenience in centering long shafts a boss is provided on the base under the spindle. On the column there is a vertical index line, so that the table may be quickly set in a central position at any height. The spindle, being driven through a friction disk, may be quickly varied in speed, and the drill is protected against breakage in case it is crowded more than it should be. The motor is of simple construction, has two steel magnet cores, form wound field coils, iron clad armature, tool steel shaft and self feeding carbon brushes. It is wound for either 110 or 220 volts direct current and is capable of developing 1-3 horse-

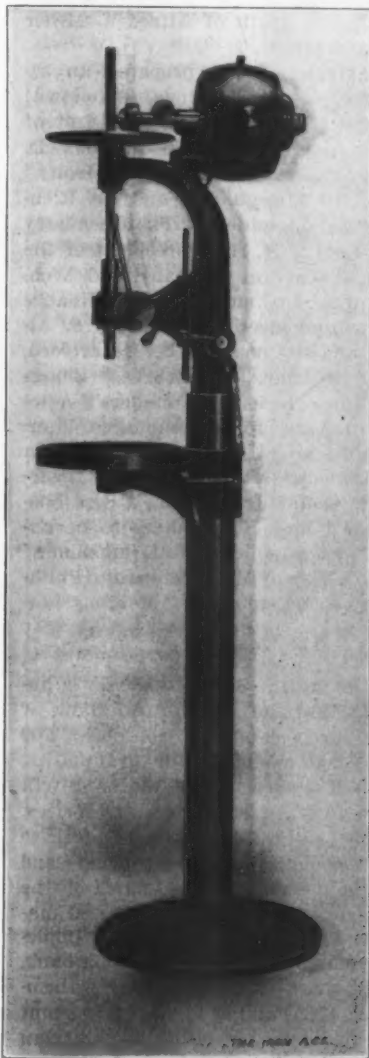


Fig. 1.—Sensitive Drill with Friction Drive.

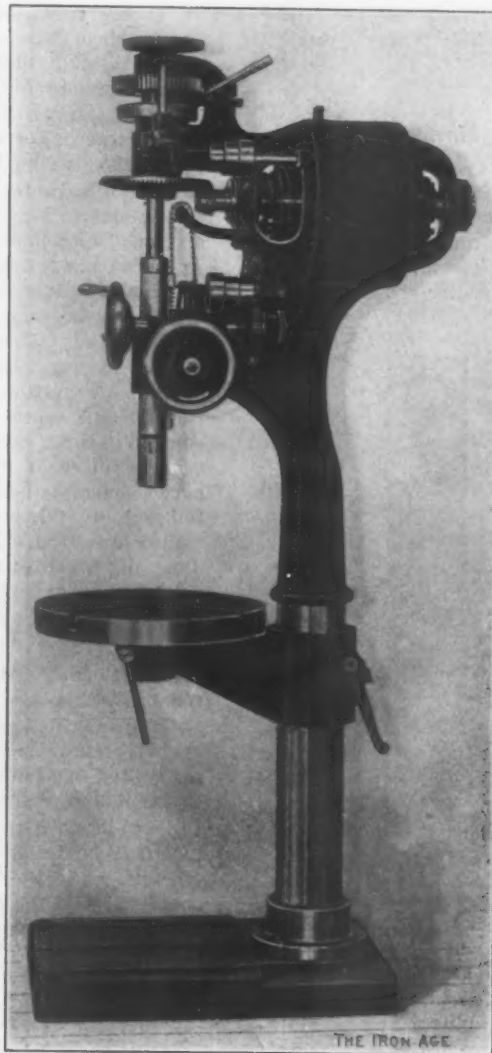


Fig. 2.—Motor Driven 22½-Inch Upright Drill.

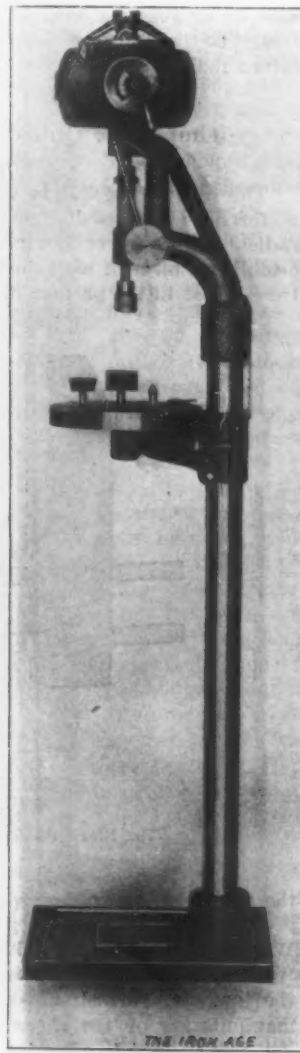


Fig. 3.—Sensitive Drill with Direct Drive.

doubled by the back gear, giving 18 speeds for the drill spindle, these varying in geometrical progression from 24 to 440 revolutions per minute. The back gear is operated by a friction engagement, so that it may be thrown in or out without stopping the motor. Three changes of power feed for each speed are obtained by the cone pulleys, which may be seen in the illustration. The power feed is provided with an automatic stop. The machine will drill to the center of a 22½-inch circle. The spindle has a traverse of 10 inches, the maximum distance from the spindle to the base is 42 inches, from the spindle to the table 28 inches, and the minimum distance from the spindle to the base is 22 inches. The machine weighs 1150 pounds. The maximum horse-power of the motor is 1½ and it is wound for either 110 or 220 volts direct current.

The sensitive drill shown in Fig. 1 is designed for light work requiring rapidity and accuracy, and will

power. Work up to 12 inches in diameter may be handled on the revolvable table. The greatest distance from the spindle to the table is 40 inches; the spindle has a vertical traverse of 3 inches in the sliding head, and the latter has a movement of 8 inches. The total height of the machine is 72 inches and its weight is 250 pounds.

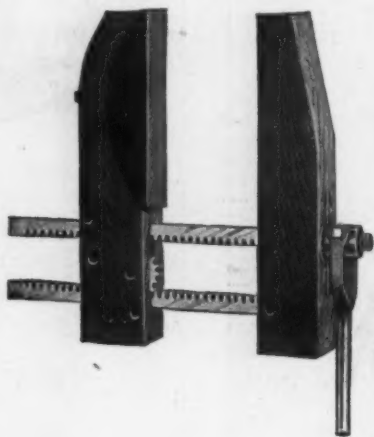
The sensitive drill shown in Fig. 3 has the same capacity and is intended for about the same work. The motor is mounted on the frame directly over the spindle, has a hollow shaft through which the spined drill spindle slides and is driven by a key. The controller is part of the motor, the starting handle being on the side. It affords three speeds, ranging from 700 to 1300 revolutions per minute. An index shows the exact speeds corresponding to each of the three positions of the starting lever. Resistance is not used in the speed control. An advantage which it has over the other sensitive drill is that there is no side pull or thrust upon the bearings. There

are but three of the latter, two at each end of the motor and one below, just above the chuck. A ball thrust bearing relieves the motor from any end thrust. In other general features the machine is similar to the other sensitive drill, having its spindle counterbalanced by a spring and its table by a weight and an index line on the column for centering the table at any height. It will drill a  $\frac{3}{8}$ -inch hole in the center of a 12-inch circle. The greatest distance from the spindle to the table is 38 inches; the vertical traverse of the spindle is 3 inches. The motor will deliver a maximum of  $\frac{1}{4}$  horse-power and is wound for either 110 or 220 volts for direct current. The total height of the drill is 73 inches and the weight 250 pounds.

The manufacturers, James Clark, Jr., & Co., have an extensive exhibit of their electrically driven tools in Block 20, Electricity Building, St. Louis World's Fair. The W. C. Johnson & Sons Machinery Company of St. Louis is the Western agent for the Willey electrically driven tools.

### The Black Quick Set Hand Screw.

The old saying "it is the little things that count" is forcibly impressed upon us occasionally when some radical improvement is made in an old and apparently established piece of workshop equipment. Just how much time is lost in the pattern or carpenter shop in adjusting



The Black Quick Set Hand Screw.

the old style hand screw, which has remained unchanged probably ever since its inception, it would be hard to say. We have bench vices at the present time in which this feature is eliminated, having an arrangement by which the jaw may be instantly adjusted to the work without manipulation of the screw, clamping being possible at any point. The hand screw shown in the accompanying illustration has the same feature, though effected in an altogether different manner, and is manufactured by the Black Brothers Machinery Company, Mendota, Ill.

One of the jaws is of practically the same form as is used in an ordinary screw clamp, but the other has a rocking segment which automatically adjusts itself to the work while it is being clamped. In place of the screws two racks are used, one being pivotally connected to the right hand jaw block, while the other extends through it and ends in a screw. The racks pass through the other jaw block and engage with two intermeshing pinions. As long as the blocks are parallel they are free to move toward or away from one another, but if pressure is exerted between the points of the jaws, tending to spread them, the gearing becomes bound. The binding effect is increased by taking a turn or two on the handle nut, causing the upper rack to be drawn in one direction while the other is forced in the opposite direction. These hand screws are made in sizes 6, 8, 10 and 12 inches, which cover practically the entire range of work in which they are ordinarily needed.

### The New England Foundrymen.

The September meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, Wednesday evening, September 14. President B. M. Shaw was in the chair. Before dinner F. R. Fletcher of the Library Bureau read a paper, entitled "Foundry and Factory System," in which he described methods applicable to the foundry and pattern shop. W. B. Snow of the B. F. Sturtevant Company, in answer to questions, told something of the workings of the system in use by his company, especially as it fixed responsibility where it belonged, and did away with the bickerings between departments as to where blame for poor work should rest. After dinner Kenneth Falconer of Montreal read a paper covering the general subject of foundry systems, handling the question from the standpoint of the accountant. Resolutions were adopted on the death of Alfred J. Miller of Whitehead Bros., Providence, R. I.

The Foundrymen's Association has prepared an attractive programme of the season's meetings, as follows: October 12, C. H. Thomas, Newark, N. J., president of the Foundry Foremen's Association, and Thomas D. West, Sharpsville, Pa., subject, "The Casting of Iron;" November 9, H. E. Field, Pittsburgh, Pa., and Dr. Richard Moldenke, Watchung, N. J., subject, "The Chemistry of Iron;" December 14, George H. Hull, president of the American Pig Iron Storage Warrant Company, and Archer Brown of Rogers, Brown & Co., subject, "The Finance of Iron;" January 11, annual meeting; February 8, Albert Sauveur, Boston, and Henry Souther, Hartford, Conn., subject, "Physics of Iron;" March 8, O. P. Briggs of the Committee of the National Founders' Association, and another gentleman, to be announced later, subject, "How to Obtain Skilled Labor;" April 12, a representative of the American Mutual Liability Insurance Company, and James Gould, Jesse Gould & Son, Boston, subject, "Insurance;" May 10, speakers to be announced, subject, "Foundry Supplies and Equipment;" June 14, E. H. Mumford, Tabor Mfg. Company, Philadelphia, and another speaker, subject, "Molding Machines."

The Belgian Consul-General at Sofia, Bulgaria, is authority for the statement that the Agricultural Bank of Sofia has decided on the purchase of 5000 iron plows, 200 grain sorting machines, 200 machines for granulating maize and 500 harrows. The directors of the bank will invite manufacturers to forward specimens and prices. It is understood that the question of excellence of these tools will be decided by a commission of land owners and officials, who will base their decision not so much on the cost, but upon the excellence of the implements and machines. American manufacturers of agricultural implements would do well to communicate with the Sofia bank, inclosing catalogues and price-lists. The orders themselves will be worth going after, and even more important will be the after results, for at the present time Bulgarian agriculture is in a rather primitive stage, and if there is to be an awakening such as has followed the introduction of modern agricultural tools into the older countries, the future trade should be considerable.

Le Roy S. Buffington, an architect of Minneapolis, has employed a firm of Chicago attorneys to prosecute suits against owners and erectors of modern steel buildings for an accounting on the basis of patents secured by Mr. Buffington in 1888. Mr. Buffington claims that he was the first to devise methods of constructing a steel building in which the walls depend upon the steel members for their support instead of being self supported. Prominent architects in Chicago, who are made defendants, profess to feel no alarm whatever because of the Buffington suits, claiming that it is an easy matter of proof that buildings of the type in question were erected before the issuance of Buffington patents, notably the Home Insurance and Tacoma buildings, which were erected partially or wholly on the principles involved in the Buffington patents.



### Philip W. Moen.

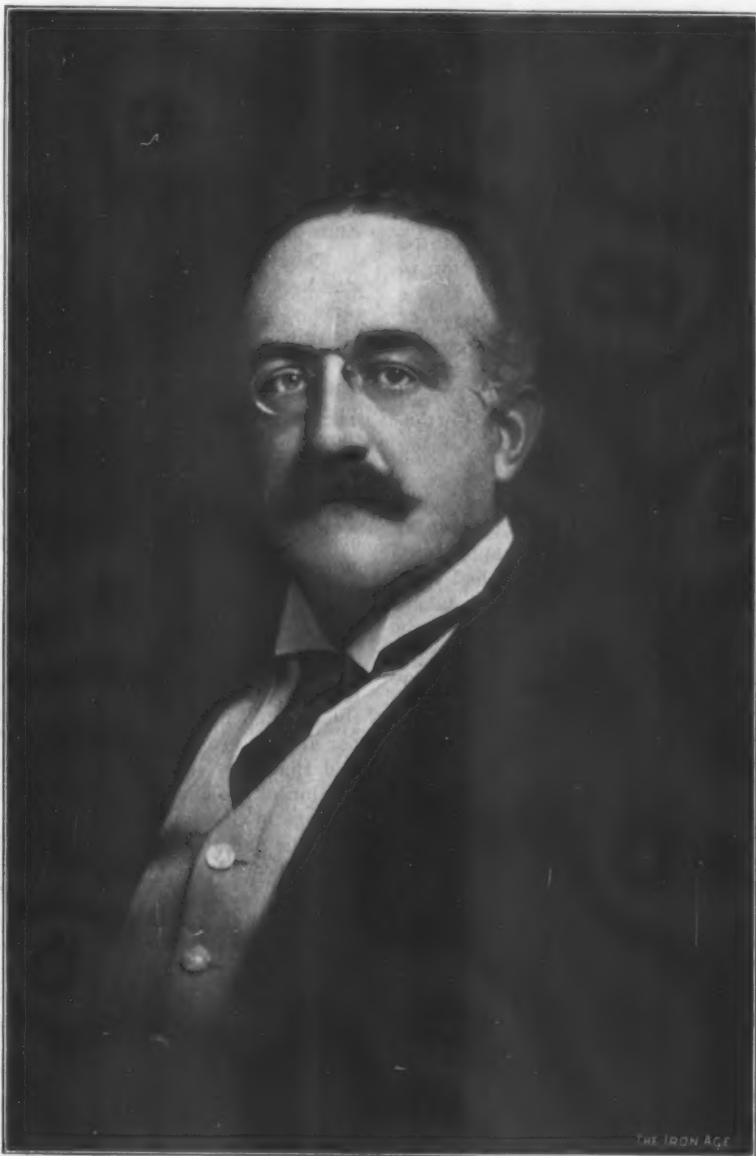
Philip W. Moen, formerly general manager and vice-president of the Washburn & Moen Mfg. Company, and later vice-president, director and the Eastern manager of the American Steel & Wire Company, died very suddenly at his summer residence, Shrewsbury, Mass., Monday, September 12, aged 47 years. He had been apparently as well as usual, though complaining of the fatigue incident to a journey to Toronto, and was retiring for the night when he was seized with a stroke of apoplexy and expired instantly. Philip Washburn Moen was the son of Philip L. Moen, who as the partner of Ichabod Washburn gave the name to the famous works at Worcester. He graduated from Yale University in the class of 1878 and went immediately to Sweden for the purpose of familiarizing himself with the methods of producing the highest grades of iron and steel, such as are used in the specialties manufactured at the Washburn & Moen Works. Though a very young man at the time, he took up the work with much earnestness, and for two years and a half labored hard and well, until when he returned to Worcester to enter the Washburn & Moen works he was recognized as an authority on the metallurgy of steel. During much of the time passed in Sweden he made his headquarters with the Stora Kopparberg Company, at Falun, where the general offices are located, and at Domnarfvet, where are the immense works. Eric J. Ljungberg, the general manager of the company, was his intimate friend and mentor, and the summer months were passed at Mr.

Ljungberg's summer place at Domnarfvet. Mr. Moen went into the works to receive the practical training, especially in the open hearth and Lancashire departments, and labored like any workman, fraternizing with the men, among whom he came to be exceedingly popular, because of the democratic spirit that afterward characterized his relations with the workmen at Worcester. He went into other Swedish iron works, including those at Munkfors, Bofors and Sandviken. Several trips to Germany, and England were made for the purpose of familiarizing himself with the methods of steel making in practice in those countries. He had acquired a large knowledge of practical steel making before he entered the Royal School of Mines at Stockholm, where he took courses in the theoretical side of his metallurgical work. At Falun, too, he had the advantage of the excellent School of Mines of that city. It was a thorough training and one that was to count much in

shaping the destiny of the Washburn & Moen works.

Upon returning to Worcester Mr. Moen went first into the cost department and developed the system of costs which worked to great advantage in the conduct of the great business. His next experience was in the purchasing department, and as assistant treasurer of the corporation. In 1885 he succeeded Charles H. Morgan as superintendent, and shortly afterward was made a director. Upon the death of P. L. Moen, in 1891, Mr. Moen became the vice-president and general manager. During his administration as superintendent and manager the Washburn & Moen business developed more rapidly and earned more money than during any other period of its history. It was during Mr. Moen's régime

that the San Francisco plant and the great works at Waukegan were built. When he returned from Sweden the company had no steel plant, and its rolling mills were not developed. His knowledge acquired abroad was of the first importance in planning the creation of a steel plant and the extension of the rolling mills. His sojourn in Sweden had another great influence in the business. In the course of his life among the Scandinavian people he had made many warm friendships and a greater acquaintance, and some of these men, experts in metal production, went to Worcester in response to his encouragement. They were the pioneers of the immigration that has given Worcester a great Swedish population, including hundreds of highly skilled men who are important units in the wire works. Two years ago Mr. Moen resigned his offices in the American Steel & Wire Company, and until his



PHILIP W. MOEN.

death devoted his time to the management of his property, and to Ard-na-Clachan, his estate at Shrewsbury, which he developed into a model stock farm and game preserve. He was exceedingly fond of country life, and was a well versed student of nature and an enthusiastic sportsman. He was an accomplished linguist, was fond of good books and was a good musician. As a citizen he was public spirited and did a great deal for charity in a quiet way. He was a trustee of several charitable and other institutions. He was active in the affairs of various financial and other business organizations, and was a member of a number of clubs. As an employer of labor Mr. Moen was held in high esteem and respect by his men, who always considered that they were sure of fair treatment at his hands.

A. H. Griffiths, chairman of Cope & Timmins, Limited, brass founders, of Birmingham, England, is now in this country.

## The Mining Engineers.

The eighty-seventh meeting of the American Institute of Mining Engineers, which was held at Duluth and surrounding points the past week, was a most interesting and instructive occurrence. Aside from President James Gayley, Secretary Rossiter W. Raymond, Assistant Secretary Joseph Struthers, and all of whom are on the administration staff, Theodore Dwight and many American engineers of high standing and a number of foreigners of prominence attended. Included among these were Jules Goujon, Moscow; Prof. B. Osann, Zellerfeld im Harz; Fr. Koenig, Eisleben; Hans P. W. Menzel and R. Goetze, Bochum, Westfalen; H. D. Klein, Dahlbruch, Westfalen; Z. F. Baum and W. Frentzel, Essen; Theo. Beckert, Breslau; Max Ludvig, Eisleben, as well as several from Mexico.

The party arrived at Duluth on Tuesday evening on the splendid steamer "Northwest" of the Northern Steamship Company, from Buffalo. A general committee of citizens interested in iron and kindred industries, of which Dr. N. P. Hulst, vice-president of the Oliver Iron Mining Company, was chairman, had been appointed some time before, and was solicitous in its attention to the members of the Institute during their stay at the head of the lakes. On Wednesday morning a session of the Institute was held, at which addresses of welcome were delivered and a few papers were read. The first of these was a brief talk by the Mayor of Duluth, Dr. M. B. Cullom, followed by an address by Hon. J. B. Cotton, general solicitor for the United States Steel Corporation at Duluth.

Mr. Gayley responded, somewhat noncommittally, as to the part the head of Lake Superior should be able to take in building up a steel industry, but in a happy vein. Dr. Raymond reminded the members that there had been three sessions of the Institute at the head of the lakes, instead of one, and rallied his younger colleagues on their shorter memories. He spoke happily of the growth of Duluth, saying that one would have to visit Lake Superior every year to keep pace with it, and he spoke of the fact that the people of Duluth built their railroad to the Vermillion range right over their Mesaba range, and thus in later developing the Mesaba went faster than their dreams. "The riches of the iron region we all know," he said, "but I would not give much for it all if there was not the great country behind it that absorbs it and that is growing so fast as to need all that can be produced."

Dr. Raymond read an appreciative note on the death of Prof. Wm. H. Pettee, who, he said, was more responsible than any man, living or dead, for the growth and success of the American Institute. He referred at some length to Dr. Pettee's painstaking accuracy in everything he undertook, to his wide knowledge and his deep information on every branch with which he came in contact, prefacing these remarks by a brief running account of his education and how it fitted him for his work. He spoke of the labor of Professor Pettee in making a regular ninth revision of the publications of the Institute as they came along, and said that of the more than 1000 publications and papers submitted for his revision, after eight prior readings, there had been three only that had been accepted by him as correct. The speaker instanced a number of cases of corrections showing the remarkable and almost superhuman work of the reviser. "He was to our work like the last second on a racing horse. It was the last second and the final touch of accuracy that made the value of the horse and the worth of the publications of the Institute, giving them precedence over any similar works issued by any society in the world."

In the absence of the author, Chas. Morgan of Worcester, Mass., the secretary read "The Case of Henry Cort," a review of Cort's puddling invention and the means by which he had lost it and his fortune as well, and had been reduced to beggary by the very Government whose existence he had done so much to save and whose wealth he had so marvelously increased. For

the invention of puddling came at a time when England stood at bay, fighting for her colonial possessions, and with Europe against her, and when she was obliged to specify for Swedish iron for naval purposes. As a result of this paper it is quite probable that a movement will be undertaken to place in Hampton churchyard, where Cort lies buried, a proper memorial tablet, the cost of which American ironmasters will be invited to defray. Arrangements have been made by Mr. Morgan with the Hampton parish authorities to place such a tablet when it is provided.

R. V. Norris read his paper on "Centrifugal Mine Fans," which will appear in the proceedings. The secretary read the paper of Manager Gardner F. Williams of the Kimberley diamond mines on the "Genesis of the Diamond."

In the afternoon the party was taken in a Government yacht and in launches to the United States concrete monolithic work at the south harbor pier, where one of the most interesting and largest pieces of concrete construction yet undertaken is under way. In the evening a reception was given the party at the house and grounds of the Northland Country Club, one of the delightful clubs of the Lake Superior country.

Thursday morning a second session of the Institute was held, at which T. F. Witherbee of Durango, Mexico, read a paper on "Special Forms of Blast Furnace Charging Apparatus." This was discussed by B. F. Fackenthal, Jr., Julian Kennedy, Prof. B. Osann and R. W. Raymond. Mr. Kennedy took up the matter of experiments with models of charging devices, and said that he thought them of little value from the fact that the models were of too small a size to prove much, and that actual charging into a full size bell was the only proper form of experimentation. No matter how successful the preliminary work of charging apparatus might be, the bell, if swung on a beam from the side of the stack, and thus sliding 2 or 3 inches in its opening, would vitiate all precautions. Professor Osann said that a number of theories in charging furnaces had been exploited, "even in Germany," but that they have not been justified by results. He reiterated what had been referred to in the original paper, that the work of largest furnaces had not always been successful in showing greater economies, and that they had not been able to reduce the fuel proportion of the charge nor the cost of production. His paper was in German. Mr. Fackenthal referred to the time when he and the president of the Institute were together in furnace work, and when Mr. Gayley had crawled into the furnace under the bell to study conditions of charging, and that it was evident that sizes of material going into the furnace had much to do with proper distribution inside. Dr. Raymond referred to the human side, and doubted if any device depending on the faithfulness of a man working far from any oversight, in a place where there might be unpleasant heat or gas, or other difficulty, was always to be depended on. C. W. Croxton, manager of the Cleveland Furnace, read a valuable paper in this discussion, treating of the work of the Brown revolving top.

Prof. C. K. Leith, whose Geological Survey monograph of the Mesaba range is one of the last of the publications of the Survey, was the final speaker and gave a condensed summary of the views of the Survey on the geology of the pre-Cambrian rocks of Lake Superior, including the iron ranges. This was illustrated by a chart of the pre-Cambrian geological sequence and by a geological map of the entire Lake Superior region. It was listened to with the utmost attention and was appreciated by the Institute. Professor Leith advanced the views that have already been published by Dr. C. R. Van Hise and himself, and these do not need extended reference here. An animated discussion followed, precipitated by President Gayley, who introduced it by the statement that the United States Steel Corporation mined 80 per cent. of the ore of the Lake region, and naturally had in its employ many of the best men to be had whose work was deserving high credit, though they had been much aided in their work by the reports, maps and records of the Geological Survey. He called on President T. F. Cole of the Oliver



Iron Mining Company. Mr. Cole wanted to note what the miner had done toward the development of the Lake Superior region, and said he was greatly aided by the United States survey, by his own geologists and, in some cases, by the work of the State surveys. He thought geologists had said little of the part mining men had played in the development of iron ore deposits and in gaining information on formations. For his part he thought no way was so good to get ore as to put down good, deep shafts, and plenty of crosscuts and drifts. He wanted to say that within two days he had twice received word of the discovery in an American district, in which "many of us are interested, where the geologists said there could not be ore below 500 feet, of rich ore at depths of 1250 and 1500 feet, and he fully expected to find ore there at 2000 feet below ground." Mr. Cole in this referred to the Bisbee, Ariz., region, where he and associates are now mining and exploring. He further said that he expected to find ore in the Gogebic range at depths of 2500 feet, far below any distance that had been looked on as possible ground.

Dr. N. P. Hulst, vice-president of the Oliver Company, was called on, and referred briefly to the work of drills and other methods on the Menominee range. President Gayley said that the Steel Corporation controlled 16,000 acres in the Marquette range, 6000 of which were on the ore bearing formations, though but a very few acres covered all their ground containing ore. He referred to the fact that the corporation had very extensive operations, and wanted the experiences of practical men taken into account. He further remarked that there was not an ore body on Lake Superior that did not come to outcrop above rock, or was not an extension of an outcrop, a statement that is accepted by mining men as absolutely correct.

After a visit to and lunch at the blast furnace, coking plant and by-product works of the Zenith Furnace Company the party left in the evening of Thursday for the Minnesota range. Two trains were utilized. One of these was a full "Pioneer Limited" service of the Chicago, Milwaukee & St. Paul road, as fine an example of modern passenger accommodation as is to be found in America. It was much admired by the party and foreign guests. It was tendered the Institute by the Milwaukee road. The other train was made up of private and official cars from Duluth. Both trains were handled as a compliment to the Institute. Friday morning the party spent at Ely, where are the Chandler, Pioneer, Zenith, Sibley and Savoy mines of the United States Steel Corporation. These mines are located in a canoe shaped basin in the oldest rocks of North America, the "Ely Greenstones," this basin occupying a longitudinal area of about 2 miles, and of about  $\frac{1}{4}$  mile in width at the widest points. Its strike is approximately northeast by east, its pitch at the east end steeply toward the west, and at the west end, perhaps, as sharply toward the east. Its dip is nearly vertical. Its deepest shafts are little over 1000 feet, and its deepest drill holes about 1300 feet. Along the course of this basin the Oliver Iron Mining Company has erected three shaft houses of steel, one of which is 168 feet high, the tallest in the world, and the others are but a few feet lower. These are so high on account of the necessity of grading ore for size, and passing it over grizzlies between the skip pocket and the car loading pocket below. A number of the party, including many ladies, went underground at the Pioneer, where the broken and friable hard ores are mined by new adaptations of the caving system. In these properties is mined the cream of Lake Superior ores, at the rate of about 2,000,000 tons a year.

In the afternoon the great Mesaba range was reached. Here the Biwabik and Duluth mines were first visited. Both are open pit, one loading with steam shovel in the sides of an immense pit, 2500 feet long and 1000 feet wide, in the form of an immense horseshoe, with a surface over a large part of the area fully 75 feet thick. Four shovels are employed in the mine, but are busy only a small part of the time. So many are needed on account of the suddenness of change in the chemical

quality of the ore throughout the pit and the necessity of getting proper ores to fill guarantees. The Duluth is also an open pit, but its ore is trammed to a shaft and hoisted, as in underground systems. It was formerly a milled mine. Biwabik has produced 925,000 tons a season, and this year will ship about 500,000. Duluth produces regularly about 150,000 tons a year. Fayal and Adams mines at Eveleth were next visited. Both are combinations of underground and open pit methods. Fayal has two great pits, one for the steam shovel and one for milling, or tramming to a skip. It is working on a new pit, where 2,000,000 yards of material are being moved from a steam shovel mine. It is now mining about 30,000 tons a week, a very low rate of production. Adams last year mined from underground 1,600,000 tons, the world's biggest record for a shaft mine. It is now developing a milling pit, where six mills were in operation on the second level at the time of the Institute's visit. This was the first glimpse of a milling property and was very much enjoyed. From there the trains ran to Mountain Iron, where about 1,000,000 tons a year are being moved from an open pit. This mine is now opened a mile north and south, and its greatest width is about 1200 feet. Shovels are now working in the fourth ore level. During the coming winter the stripped area will be materially widened and a loop main line track put through the mine. The product of this mine is apparently limited only by the possibilities of the railway that serves it. It is the only large open pit mine that is entirely held under fee, so that its operators pay no royalty, and the thickness of stripping, as compared to the depth of ore beneath it, is so small that mining, including the stripping charge, is at an astonishingly low figure. From here the party went to Hibbing and spent the night. During the evening an entertainment was held in the Hibbing Hall, and various members of a customarily staid and quiet party instructed and amused their associates by the most remarkable and delightful stunts. A feature of the evening was the singing by the German chorus of nine voices, though all parts asked for were most artistically handled and afforded the most delicious entertainment.

Saturday morning the trains pulled into the Stevenson mine, out of which this year about 1,500,000 tons of ore are being moved. It is a tremendous V-shaped body of high grade coarse Bessemer ore and is much in request by furnacemen. Three shovels are in ore and the mine is producing up to 15,000 tons daily. The pit is about  $\frac{1}{2}$  mile, east and west, in ore, and is being widened by new stripping on the north bank. Later in the morning the party went into the Mahoning, a vast oval opening, arranged with standard gauge tracks in spirals, to the third ore level. A Sunday quiet prevails at the Mahoning constantly, and the mine is good for an amount of ore far in excess of what it is mining, an average of about 1,000,000 tons a year. This year's product is somewhat below that. Later the Hull and Rust, underground mines of the Oliver Iron Mining Company, were seen. Neither is now active, but the company is figuring on removing the surface and making them the largest open pit mine in the world. This work will probably be undertaken soon, though no announcement of a decision has been made. The company's Burt pool mine, open pit steam shovel, now producing about 1,000,000 tons, was next looked into. It is arranged so that its mining costs are about as low as those of any property on the Mesaba. This completed the visit, and the party returned to Duluth, inspecting on arrival the docks of the Duluth, Missabe & Northern road, which are now handling about 950,000 tons of ore a month.

Sunday night departure was taken, and Monday morning the Institute again met in Houghton. The Lake Superior copper country and the iron mines of Ishpeming were inspected this week, and from Ishpeming they go to St. Louis, where an adjourned session will be held. Many of those in attendance have already left for their homes. The Lake Superior session has been exceedingly interesting, and the inspection of the vast civil engineering propositions on the Mesaba, called open cut mines, was valuable in the highest degree.

D. E. W.

## Canada's Special Tariff.

### Dumping and Rebates.

TORONTO, September 17, 1904.—United States exporters to the Canadian market will find it to their advantage to familiarize themselves with the provisions of the anti-dumping amendment inserted in the Dominion tariff law last session. They will obtain much information on the subject from a circular issued by the Customs Department in the latter part of August and supposed to be distributed, more or less fully, among the exporters of countries from which Canada buys goods. This circular contains the regulations adopted by the Department for the carrying out of the law and gives explanations for the guidance of foreign exporters, Canadian importers and customs officials. It is not exhaustive, for questions have already arisen to which it yields no answer. For example, Canada has a rebate provision in its tariff law and it is not clear how that provision is to be affected by the anti-dumping clause.

If a Canadian manufacturer of radiators, agricultural machinery or other product of iron or steel should import pig iron from the United States he would pay the duty upon it as lawfully ascertained by the collector. The regular duty would be \$2.50 per ton. If the purchase price were 10 per cent. below the regular market price of, say, \$12.50 per ton, then 10 per cent. of the regular market price—that is, \$1.25—would be added to the duty, making the total duty \$3.75 per ton. Let us suppose that the radiators, agricultural implements, or whatsoever manufactured from this pig iron, are exported. The manufacturer of them would be entitled to recover from the Government 99 per cent. of the duty paid on the constituent American pig iron. But does this mean no more than it formerly meant—namely, 99 per cent. of the regular duty of \$2.50 per ton? On this problem the circular says nothing. Logically, the refund should be 99 per cent. of all the duty paid, however calculated, for the purpose of the rebate arrangement was to enable Canadian manufacturers to produce at a sufficiently low cost to meet competition abroad. The theory of the rebate clause is, of course, the very opposite of the anti-dumping clause, it being postulated in the former that duties are an obstruction to industry, and in the latter that they are an impulse to it. Canadian manufacturers of pig iron, however, will quite naturally hold that if there is a fair price for imports of that material which are to be made into products for home consumption, there should be a fair price also for imports of it which are to be made into products for exportation. It looks as if the question might become a pressing one if all the furnaces now ready for production are kept in blast. Those of the Dominion Iron & Steel Company, the new one of the Nova Scotia Steel & Coal Company and those of the Algoma Steel Company will produce more than can be used for some time in the steel hearths, rolling mills and foundries engaged on purely home orders. There will be a surplus to be directly exported or to be utilized by industries whose products are exported. Hence the exporting radiator companies, agricultural implement companies, &c., will have pig iron of Canadian make more freely offered to them, especially if anti-dumping duty is never to be included in rebates.

This rebate arrangement has had a beneficial influence on Canadian industry. First, it has made possible an export trade which could not have been built up without it, and, secondly, it has brought branches of American industries into the country. It is at least doubtful if the International Harvester Company would have established its great plant at Hamilton had there not been a practical exemption from duty on imported material manufactured into products for export. Many other industries which work up iron and steel partly for export have been attracted to the country by the rebate clause of the tariff.

### Not More Than Half the Regular Duty.

The anti-dumping duty was adopted as a means of preventing the sale here of dutiable imported goods at a lower price than that regularly current in the country of production. But its countervailing operation is limited.

It is never to exceed 50 per cent. of the regular duty. The examples given in the circular may be here used to illustrate:

No. 1. Take the case of a piece of machinery sold from another country to Canada at, say, \$90, but which is usually sold for home consumption in the country of export at \$100: the calculation under such circumstances would be as follows:

First, ordinary duty at 25 per cent. on the fair market value for home consumption—viz., \$100—\$25.

Second, add for special duty the difference between the selling price and the fair market value—viz., \$10. Total duty, \$35.

Note.—If the difference between the selling price and the fair market value, as aforesaid, has been \$12.50 or more, the maximum special duty would be imposed—viz., \$12.50, or one-half the ordinary duty charges based upon the fair market value.

No. 2. Take the case of bar steel sold from abroad to Canada at, say, \$23 per ton, but which is usually sold for home consumption in the country of export at, say, \$27 per ton. The rate of duty is \$7 per ton. The calculation would be as follows:

First, ordinary duty at \$7 per ton—\$7.

Second, add for special duty one-half the ordinary duty, or \$3.50, the difference between the selling price and the fair market value in the country of export being equal to and in excess of that amount—viz., \$3.50. Total duty, \$10.50.

### Limited to 15 Per Cent. ad Valorem.

It is further provided that articles mentioned in items 224, 226, 228 and 231 of the Tariff are to bear a dumping duty of not more than 15 per cent. ad valorem. These items are here given:

224. Iron in pigs, iron kentledge, and cast scrap iron, \$2.50 per ton.

226. Iron or steel ingots, cogged ingots, blooms, slabs, billets, puddled bars and loops or other forms, n.o.p., less finished than iron or steel bars, but more advanced than pig iron, except castings, \$2 per ton.

228. Rolled iron or steel angles, tees, beams, channels, joists, girders, zees, stars or other rolled shapes, or trough, bridge, building or structural rolled sections or shapes, not punched, drilled or further manufactured than rolled, n.e.s., and flat eye bar blanks not punched or drilled, 10 per cent. ad valorem.

231. Rolled iron or steel plates not less than 30 inches in width and not less than ¼ inch in thickness, n.o.p., 10 per cent. ad valorem.

As the Government pays bounties for the production of such articles as are enumerated in the above quoted items, a maximum dumping duty of 15 per cent. ad valorem is considered sufficient for them.

Also wire rods of ¾ inch in diameter, though otherwise on the free list, are subject to a dumping duty of 15 per cent. ad valorem.

It is not explained in the circular how this dumping duty is to be graded on this subdivision of the imports. It is supposed, however, that if the dumping price varies from the regular price by, say, 10 per cent. of the latter, the dumping duty applied shall exactly be 10 per cent. and *pari passu* up to 15 per cent. As the regular duties are given in the quotation of the items above, the gross maximum duty can be calculated by any one who knows the market prices.

### Exemptions.

If the goods imported in any given case are of a kind not made in Canada they are not to be subject to the anti-dumping duty. The list of iron, steel and hardware articles exempted by this provision is not so long as it would have been found to be a few years ago, for there has been a considerable expansion and specialization of manufacture in such lines since the opening of the century. How diversified Canadian industry has become can be learned by the Government from the directory of the Canadian Manufacturers' Association. There undoubtedly is a considerable number of articles whose manufacture has not yet been begun in this country.

If the regular duty of a given article amounts to 50 per cent. of its market value no anti-dumping duty can be imposed. There is no ad valorem duty so high, and no hardware or kindred article can at the moment be thought of on which the specific duty bears that ratio to the present price current. The duty of half a cent a pound on nails is about the highest of the specific duties on articles in the hardware list.

It was found advisable not to adhere too closely to the line defining the regular market price. Discretion was given to the Minister of Customs to allow somewhat for the instability of current prices, which cannot be expected to rest in a state of equilibrium. The question of



the leeway to allow for the play of competition in the market of production was decided on the advice of the Board of Customs. Five per cent. was the exemption limit decided on. That is, if a given shipment of goods has been purchased in the United States or other outside country at a price not more than 5 per cent. below that ruling there, the dumping duty is not to be imposed.

Articles subject to an excise duty are not to bear the dumping duty. But no article in the iron, steel or hardware trade is subject to an excise duty in Canada.

#### Duplicate Invoices.

The regulations require that invoices in duplicate, with proper certificate, shall be delivered to the custom house with the bills of entry for all imported goods. Heretofore but a single copy was required. Of the two now called for one is to be filed, as usual, at the port of entry, and the other is to be sent with a copy of the entry to a special checking branch at the customs headquarters in Ottawa. Referring to the duplicate invoice requirement, the circular says:

This is a very important reform, and will undoubtedly be of much benefit, inasmuch as it will tend greatly to insure uniform collection of the revenue in accordance with the law. It is the intention to have all invoices closely scrutinized and compared at the checking branch at headquarters by a competent staff. It may be noted here that the United States customs authorities require two copies of each invoice to be presented and left with them.

Each invoice must show in one column the actual price paid for the goods, and in another column the fair market value in the exporting country. A special form of invoice has been prepared and approved by the Customs Department, and specimen copies can be obtained at any Canadian custom house. A circular giving them has been issued by John McDougald, Commissioner of Customs, Ottawa.

#### Certification.

Instead of the invoice certificate hitherto used, the following is to be written, printed or stamped on all invoices:

That the said invoice contains a true and full statement showing the price actually paid or to be paid for the said goods, the actual quantity thereof and all charges thereof.

That the said invoice also exhibits the fair market value of the said goods at the time and place of their direct exportation to Canada, and as when sold at the same time and place in like quantity and condition for home consumption in the principal markets of the country whence exported directly to Canada without any discount or deduction for cash, or on account of any drawback or bounty or on account of any royalty actually payable thereon or payable thereon when sold for home consumption, but not payable when exported, or on account of the exportation thereof or for any special consideration whatever.

That no different invoice of the goods mentioned in said invoice has been or will be furnished to any one, and that no arrangement or understanding affecting the purchase price of the said goods has been or will be made or entered into between the said exporter and purchaser or by any one on behalf of either of them, either by way of discount, rebate, salary, compensation, or in any other manner whatsoever other than as shown in the said invoice.

The form of oath to be taken by importers and of declaration to be made abroad as to goods consigned without sale has been changed so as to cover arrangements or understandings not disclosed in the invoice.

#### Time Allowed.

On one more point the circular must be quoted:

The regulations including the new forms of oaths and certificate are to take effect on October 1. Recognizing, however, that it takes time to disseminate information among exporters in foreign countries in such matters, and that it may, therefore, be some considerable time before the regulations can be complied with entirely, collectors of customs are being instructed that they may for a temporary period after October 1, but not later than December 31, accept entries on invoices bearing the old certificate "J," instead of the new form "M." Duplicate invoices, however, are required to be delivered with bills of entry after October 1 in all cases, but to enable importers to comply with the regulations in this respect collectors may permit them to make an additional copy of the original certified invoice, such copy to be compared and initialed as a true copy by the customs officer.

#### Ascertaining Values.

As has been shown, one copy of every invoice must be forwarded by the collector to a checking branch in Ottawa. The mention of such a branch of the Customs De-

partment suggests the method by which market prices in the country of production are to be officially ascertained. Invoices cannot be checked without a criterion of current values, and that the checking branch will be supplied with by agents placed at various commercial centers in the chief countries which export goods to Canada. In the circular referred to it is stated that "the Department has already matured plans for assuring full information as to foreign market values. In this connection officers have been, and are being, assigned to make investigations in other countries."

H. J. Gould, formerly of the agricultural implements firm of Frost & Wood, Smith's Fall, Ont., has been appointed price reporting agent in New York. H. S. Scott has just resigned the commercial editorship of the *Toronto Globe* to accept an appointment of the same kind as Mr. Gould's. His duties, it is understood, will be divided between Buffalo and Boston, or, rather, will be extended over a strip of country of which these cities are the extreme western and eastern points. Agents are to be placed in Chicago, Cleveland and other American cities. It is taken for granted that these officers of the Customs Department's intelligence service will have no difficulty in getting information at first hand. One Government newspaper puts it thus:

The department is well aware that its agents will have no authority to enforce an examination of the books of United States exporters, but what is relied upon to insure this privilege is the fact that refusal to comply with the requests of agents for such information will naturally be visited by a drastic enforcement of the anti-dumping clause in every case, as the agent being thrown upon his own resources for information will not be apt to report local prices to the advantage of the American exporter who refused to allow his books to be examined.

Of course accurate information as to prices has always been necessary for the administration of the customs service, and has been more than ever indispensable since the tariff revision of 1897 substituted ad valorem duties for so many specific duties. To protect the revenue and to prevent the trade irregularities incidental to undervaluation, the Government had to keep its collectors fully advised as to prices in countries whence imports came. The standard authority for iron, steel, metals and hardware was the price-list of *The Iron Age*, whose quotations thus came to be looked upon as practically official.

C. A. C. J.

## The New Prices on Billets, Sheet and Tin Bars.

At a meeting of the Billet Association, held in Pittsburgh on Monday, September 19, a reduction of \$3.50 a ton on Bessemer and open hearth billets and \$2 a ton on sheet and tin bars was made. The new prices are as follows: Bessemer and open hearth billets, 4 x 4 inches up to 0.25 carbon, \$19.50; 0.26 to 0.60 carbon, \$1 extra; 0.61 to 1.00 carbon, \$2 extra. Billets under 4 x 4 inches, \$2 a ton extra. Sheet and tin bars, long lengths, \$21.50; cut to lengths, \$22. These prices are f.o.b. Pittsburgh, to which actual freight to destination should be added. Under the old schedule of prices the mills absorbed part of the freight, making comparatively low delivered prices to some points; but this has been abolished and actual freights are now added to the Pittsburgh prices, as given above, and which also apply for Youngstown and Wheeling districts. We give below delivered prices on billets and sheet tin bars in long lengths to some of the principal points of shipment, as follows:

	Billets.	Sheets and tin bars in long lengths.
New York City.....	\$22.10	\$24.10
Cincinnati.....	21.80	23.80
Cleveland, Ohio.....	20.90	22.90
Philadelphia.....	21.90	23.90
Columbus, Ohio.....	21.35	23.35
Chicago.....	22.50	24.50
New England points.....	22.50	24.50
Harrisburg.....	21.70	23.70
Cambridge City, Ind.....	22.05	24.05
Crawfordsville, Ind.....	22.50	24.50
Louisville, Ky.....	22.50	24.50
Portsmouth, Ohio.....	21.30	23.30
Springfield, Ohio.....	21.70	23.70
Zanesville, Ohio.....	21.30	23.30



## A French View of the English Iron Industry.\*—IV.

### The Cleveland and Durham District.

Of all the metallurgical districts of Great Britain that of Cleveland is the most favored. If it has not from the outstart drawn all the possible advantages from its natural conditions it has during the last two years displayed a remarkable activity, and shown a just conception of modern metallurgical conditions. The industrial organization has become very simple. In the north near the great shipyards of Newcastle there is a group of four works, the open hearth plants and the plate mills of the Armstrongs, a dependency of their famous shops; the independent works of John Spencer; the plants of the powerful Palmers Company, directly supplied by five blast furnaces, and finally the old and prosperous Consett Company, with its seven blast furnaces and its 27 open hearth furnaces. The latter curiously are located in the interior, and on a plateau at no great distance from the Durham collieries, but at a greater distance from the unloading ports for its Spanish Orconera mines, which are operated in partnership with Krupp and Dowlais. The Consett Company is the greatest producer of open hearth steel in Europe, making about 300,000 tons per annum.

In the south, near Middlesbrough, close to the outcrop of the iron ore deposits of Cleveland, and 25 to 30 miles from the Durham collieries, are three enterprises which now divide nearly the entire steel production: 1, Bolckow, Vaughan & Co., with 27 blast furnaces, six Bessemer converters and seven open hearth furnaces, and selling besides considerable quantities of foundry iron, with collieries producing 150,000 tons of coal per year, and mines yielding 1,550,000 tons of the best ore in the district, receiving also 400,000 tons from its own mines at Bilbao and in the south of France; 2, Dorman Long & Co., which has gathered together in 1902 and 1903 16 blast furnaces in two neighboring plants, Clarence and Acklam, four basic converters and 19 open hearth furnaces in two adjoining plants, Britannia and North Eastern. The concern has its own coal mines producing 788,000 tons of coal, and 365,000 tons of coke, and its own mines yielding 1,130,000 tons of ore and 240,000 tons of limestone. Finally, there is Cargo Fleet, which has just absorbed the South Durham and the Weardale companies, thus consolidating collieries, local iron mines, two blast furnaces and 21 open hearth furnaces, and one Talbot furnace.

At the same time that these consolidations were brought about the different concerns undertook the betterment of their plant. Consett, after having put the furnaces into shape since 1899, recently sent a commission to the United States and also acquired the mines of Calasparra, 80 miles from Cartagena, Spain. Bolckow, Vaughan & Co. placed in the hands of an American the problem of improving its blast furnace plant. Dorman Long installed at the Clarence Works new open hearth furnaces and new rolling mills, and is rebuilding the Britannia plant completely. Cargo Fleet has carried out important improvements in its ore mines. The company is developing the plant of the Weardale Company, is building three open hearth furnaces and projecting the construction of blast furnaces. There will, therefore, be in the Cleveland district only three rail mills and four great undertakings producing plates. All these improvements were very urgent because certain of the consolidated plants had yielded very modest results. The equipment of the Middlesbrough district was in a general way powerful and designed on large lines, but the most modern improvements existed only in exceptional cases. Thus the blast furnaces did not produce on an average more than 110 tons per day, and the by-product recovery coke ovens had hardly been built, only two works having substituted them for the beehive oven. The greater part of the open hearth plants have a capacity of 30 to 50 tons, but the handling of them required considerable improvements. The result is that the efforts of the iron-

masters of the Cleveland district have been directed during the past three years more particularly to the equipment rather than the total capacity of the plants. Bolckow Vaughan is now making 250,000 tons, and there is no thought of increasing this figure, which seems to be the production aimed at by its two rivals.

The natural resources which justify these efforts at improvement may be described as follows: On the one hand, there are the collieries, easily worked, yielding an unrivaled coke. The coal costs 3 shillings to 3 shillings 9 pence, royalty included, but without general costs or amortization fund, thus reaching a total cost of less than 5 shillings, without allowance for profit. The cost of coking ranges between 1 shilling 9 pence and 2 shillings 3 pence, the ovens yielding 66 per cent. The transportation from the mines to the works on slack coal or on coke costs about 2 shillings. The coke therefore costs, delivered to the furnaces, from 10 shillings 6 pence to 11 shillings. It sold at 11 to 12 shillings in 1893 to 1894, and 13 shillings at the close of 1903. At the present time it costs 14 shillings delivered to the works. The by-product oven coke would cost from 8 to 9 shillings, this depending upon the value of the by-products, and assuming that the iron works were operating the coke ovens themselves.

The second point in connection with the Cleveland district is the possession of a shallow deposit of ore carrying an average percentage of phosphorus. To the north it consists of a single bed, with a working thickness of 8 to 16 feet, and relatively rich. Toward the south it splits into two deposits, one of them workable for 5.50 feet, growing poorer and more siliceous to the southward. The cost of mining does not seem to go beyond 3 shillings 3 pence, including royalty of 4 pence. The use of compressed air machines has counteracted the growing demands of labor. The average cost of transportation to the works is 1 shilling 3 pence. The ore must then be calcined, which increases its price 1 shilling 3 pence, but carries its iron contents from 25 to 32 per cent. to 38 to 40 per cent. of iron, with 0.70 manganese and 0.62 phosphorus. Silica ranges between 15 and 19 per cent., which requires an addition to the charge of 600 to 700 kg. of limestone. The latter, which is mined at a distance of 25 to 30 miles from the works, costs about 4 shillings 6 pence. In the open market raw ore, not calcined, costs 3 shillings 11 pence at the mine. So far as the foreign ores which are so largely imported in the Cleveland district are concerned, they consist, first, of Bilbao or Santander ores, the quantity being 1,200,000 tons. For this the price is 15 shillings 3 pence, Middlesbrough. The ore is imported from mines in the southern part of Spain, to the extent of 290,000 tons per annum, and from mines in Sweden, the tonnage being 270,000 tons per annum.

The consumption of coke averages 1050 kg. for hematite and 1150 to 1200 kg. for basic pig. Thomas pig iron requires a pretty heavy addition of manganese and a costly mixture of phosphoric clinker or Swedish ores. Thus supplied, the Cleveland district produced in 1903 3,100,000 tons of pig iron, of which 1,400,000 tons was foundry and mill iron, 400,000 tons was Thomas basic Bessemer and 1,100,000 tons was Bessemer. The district exported 510,000 tons of iron, against 847,000 tons in 1890, and shipped 525,000 tons to Scotland, as compared with 239,000 tons in 1900. The pig iron thus shipped is almost exclusively foundry or mill iron, the other grades being worked into steel in the district. The production of steel was 335,000 tons of Bessemer for rails and shapes and 900,000 tons of open hearth, chiefly for ship plates and ship shapes. There were exported in 1903 421,000 tons, the greater part thereof being rails. In 1897 the export was 559,000 tons.

H. C. Barlow, at one time president of the Evansville & Terre Haute Railroad, has been appointed general manager of the Chicago Snippers' Association, which will have offices in the Railway Exchange Building. At present Mr. Barlow is traffic manager of the General Paper Company, 135 Adams street, Chicago. The Chicago Shippers' Association includes several hundred of the largest

\* Continued from *The Iron Age*, September 1, page 21; September 8, page 14, and September 15, page 29.

manufacturing and jobbing interests of the city, and the association was formed for the purpose of preventing any freight rate discriminations against the city of Chicago and to protect the interests of Chicago shippers in general. It will be conducted along broad lines and will not be a bureau for adjusting claims or for righting individual grievances.

### The La Belle Iron Works.

The annual meeting of the stockholders of the La Belle Iron Works, Steubenville, Ohio, was held at Wheeling, W. Va., on September 13. The old Board of Directors was unanimously re-elected, as follows: A. J. Clarke, N. E. Whitaker, A. J. List, H. C. Frenzheim, A. H. Woodward, J. E. Wright, W. S. Foltz, D. J. Sinclair, E. W. Mudge, I. M. Scott, George Greer. Officers were re-elected as follows: I. M. Scott, president; E. W. Mudge, vice-president and general sales agent; W. S. Westfall, secretary; W. S. Crawford, general manager; A. J. Clarke, chairman of the Board of Directors.

Following is the company's statement for the year ending July 1, 1904:

Assets.	
Real estate.....	\$7,052,360.03
Coal properties.....	366,213.03
Coke property.....	479,257.08
Ore property.....	328,489.70
Limestone.....	24,967.50
Total properties.....	\$8,251,288.06
Patterns.....	14,770.94
Treasury stock.....	140,142.50
Suspended bills.....	29,200.21
Prepaid interest.....	5,401.79
Inventory.....	\$1,326,675.82
Bills receivable.....	19,975.81
Accounts receivable.....	635,567.21
Cash.....	147,040.35
	2,147,259.19
Total.....	\$10,588,062.69
Liabilities.	
Capital stock.....	\$7,000,000.00
Bonded indebtedness.....	2,500,000.00
Bills payable.....	\$193,526.90
Accounts payable.....	311,325.68
Pay roll.....	63,373.39
Accrued interest.....	25,641.49
	593,867.46
Contingent fund and maintenance account.....	32,203.31
Surplus to June 30, 1903, as reported	
at last meeting.....	448,944.14
Less corrections made since.....	116,598.80
	\$331,985.34
Additional profits, six months ending	
December 31, 1903.....	217,683.13
	\$549,668.47
Less inventory depreciation.....	344,003.08
Leaving surplus December 31, 1903.....	\$205,665.39
Add profits six months ending June	
30, 1904.....	256,326.53
	461,991.92
Total.....	\$10,588,062.69
Total manufacturing profits for year ending June	
30, 1904, exclusive of corrections on fiscal year	
ending June 30, 1903, and inventory depreciation	
Annual sale of pipe covered by above statement,	
38,334 tons.....	\$474,009.00
Gross amount of sales.....	6,610,300.00
Values of property—	
Coal.....	365,000.00
Ore.....	382,000.00
Coke.....	470,000.00

**Sheet and Tin Bar Mills at Youngstown.**—The Republic Iron & Steel Company has definitely decided to add mills at its Bessemer plant at Youngstown, Ohio, for the rolling of sheet and tin bars. This project has been under way for some time by Republic Iron & Steel Company, and it was only recently that it was definitely decided to build the mills. All plans have been prepared and prominent builders of rolling mill machinery are now bidding on the work. It is expected to have the mills completed and ready to turn out sheet and tin bars in January next. The Republic Company is also considering the advisability of putting in mills for the rolling of rails, but a definite decision in this matter has not yet been reached.

### National Metal Trades Association Notes.

Cincinnati, September 19, 1904.—The committee having in charge the arrangements for the Cincinnati Metal Trades Association dinner, which will be held on October 6, is making elaborate arrangements for the entertainment of members and guests.

H. N. Covell, president of the national association, anticipates calling the next meeting of the Administrative Council at Cincinnati about October 24, while W. D. Sayle, chairman of the Plan and Scope Committee, is figuring on October 10 as the proper time to hold the meeting of his committee to formulate recommendations to be presented to the Administrative Council.

W. P. Eagan, commissioner, is at Chicago this week, with a view to increasing the membership of the association, and also looking after the business incident to the late labor difficulties in that city.

The National Founders' Association has opened temporary quarters in room 1433 Union Trust Company Building, Cincinnati, where it is actively engaged in looking after the foundries interested in the molders' strike.

J. W. Lee, manager of the employment department of the St. Louis Metal Trades Association, reports that the situation of the iron molders' strike in his city is quite satisfactory, it being impossible to employ all the applicants for work in the struck foundries.

The New York Metal Trades Association held a meeting on September 15, which was especially well attended. It was unanimously decided to establish a labor bureau in connection with the other departments of the association, and steps were taken accordingly.

The Manufacturers' Association of Pittsburgh is receiving applications for work in excess of calls for help. The local secretary at this point reports the situation quiet, with no labor troubles of any kind reported for over a month.

Reports received from the Worcester Labor Bureau indicate a revival of business generally.

The labor situation at Harrison, N. J., is in splendid condition, no trouble of any kind being reported, either among machinists or molders.

All reports received go to show that the Rock Island Arsenal machinists are very strongly organized.

Information from Honesdale, Pa., leads us to believe that the strike of the machinists in the shops of the National Elevator & Machine Company was caused by the business agent, who, it appears, was anxious to show his superiority over the National Metal Trades Association, and thought that Honesdale was a good place to do it, on account of its isolation. Now the strikers are anxious to return to work, but are afraid of being black-listed if they do so. Their positions, however, have been filled, and no disorder of any description is being experienced, and the plant is running as usual.

Indications are that there will be a very substantial increase in the membership of the association this year, due, no doubt, to the splendid showing made in the late labor troubles at Chicago.

The Springfield Boiler & Mfg. Company, Springfield, Ill., reports that it has had absolutely no trouble of any kind since the strike a year since, which lasted 18 months and resulted in an open shop.

### The Hoop Mill Situation at Youngstown, Ohio.

The Carnegie Steel Company of Pittsburgh is going steadily ahead filling the hoop mills at Girard and Youngstown with non-union men. The company has just secured a sweeping injunction against the strikers at the Girard mill, which prevents the strikers from gathering around the mill or the railroad station, or from molesting persons in the employ of the company, or those who go there for the purpose of entering its employ. This injunction will have the effect of shortening the strike, as it will enable the company to put men in the mill without molestation from the strikers. It is expected that within a very short time the Girard and Youngstown mills will have a full complement of men and will be in operation to full capacity.





cents. The list is a long one, taking in every line of help in this and other occupations.

The report shows that the wages paid for the same general class of labor varies very much in different industries. Take, for instance, the wages of machinists. In the class of machines and machinery, the average wage is 27.7 cents an hour; in metal goods, 26.2 cents; in the boot and shoe industry, 30 cents; in building, 25.6 cents; in paper and paper goods manufacturing, 30 cents; in cotton mills, 21.3 cents, and in woolen mills, 22.3 cents.

All these figures are for Massachusetts. Doubtless they differ a good deal from those of other sections of the country, and consequently the few figures here taken from the Massachusetts report afford a basis of comparison by employers of the same classes of labor in other States and abroad.

### An Impending Change in Drill Presses.

Within the next few months a number of new drill presses will be placed on the market designed for the special purpose of taking drills made of the new tool steels. Most of the builders of this class of machine tool became convinced some time ago that the self hardening steel is practicable for twist drills, and they have since been working hard over the problem of a drill press that will stand up to the capacity of such steel. Some of the machines are already built and have been subjected to severe tests, that have proved satisfactory to their makers. Now they are going upon the market. The type of drill press in use to-day can do little with the new steel. The capacity of the machine ends long before the limit of the drill is reached. Consequently, the drill press manufacturers found themselves in the plight of the lathe and planer builders of several years ago, when a general redesigning and overhauling had to be done. Rigidity and general strength and great spindle speeds were the objectives, which have now been accomplished.

The commercial value of self hardening steels for the purposes of twist drills was for a long time held in considerable doubt. The steel had to be fashioned before hardening, of course, and in the hardening the percentage of poor drills was at first very high. But the manufacturers of the steel and of the drills have gone deep into the problem of treating the metal, and now the claim is made that the difficulties have been sufficiently mastered. Twist drills of the new steel are to be had in the market and are in use in many shops and factories. Perhaps the best proof of the excellence of the tools is that the machine builders recognize the fact that they must provide drill presses for them.

The builders are not quite ready to give figures of what their new drill presses will do, excepting to state that with a self hardening drill three or four times as much work can be done on one of the new machines as is being done to-day with the old type of machine using the ordinary carbon steel. One test, made, not by a machine builder nor by a manufacturer of the steel or drills, gives an inkling of what may be expected by users of this class of machines. A  $\frac{5}{8}$ -inch drill was driven through cast iron with a feed of 0.02 foot per revolution at the spindle speed of 420 revolutions per minute. This means that the drill passed through the metal at the rate of 8 feet per minute, which is certainly four times as fast as the very best practice with carbon steel drills under the most perfect conditions; that is to say, where there is perfect alignment of the drill and where the machine is designed to do its best work with that particular size of drill, as in shops where a great deal of

drilling of certain sizes is required. Other problems are being worked out, such as, for instance, whether the present standard angle of 59 degrees will be the most efficient for drills of the new steel. This angle was determined as the maximum of acuteness at which reasonable exemption from overheating could be obtained. It is claimed by experts who are going into the subject that as the new steel will stand far greater heat than the ordinary tool steel, a sharper angle is possible, and probably desirable, and that would mean a material reduction of the thrust. The solution of this and other questions may have important bearings upon future drill press practice.

It may be that the builders of the new drill presses have not reached the limits of the new steel, but they have certainly obtained machines that will do wonderful things to metal in rapidly reducing it, just as the modern lathe and planer have done wonderful things by the use of the new steel in cutting tools. Ball bearings and other devices to reduce friction to a minimum have been embodied, because in commercial practice very high spindle speeds with small feed per revolution are considered more practical than the slower speed and large feed, such as that used in the test just alluded to. One such sensitive drill press operates at more than 2000 revolutions per minute for small sizes of drills, the thrust being taken care of by means of ball bearings. With a  $\frac{7}{8}$ -inch drill, at a proportionately slower speed, this press responds readily to a firm, hard pressure of the feed lever without a sign of remonstrance. In a similar machine of the present type a drill of this size would be entirely out of the question, of course, as would any other drill much over  $\frac{3}{4}$  inch.

The builders of the new drills entertain high hopes of good business, arguing that in large shops and factories, where there is a great deal of drilling—and some establishments number their sensitive drills by the hundreds—it will easily pay a manufacturer, in labor saved, to throw out all his old machines and replace them with the new—one of the new to three of the old, which would be a conservative ratio, they say. Doubtless these hopes will be realized in the same proportion as the higher power engine lathe and planer have replaced the old types for certain important classes of work.

The revival of the effort to produce a commercial peat in a form suitable for general consumption that came with the coal famine of the winter of 1902-1903 threatens to bring with it a number of stock jobbing corporations, which are taking the opportunity, while the lesson of costly fuel is still fresh in the public mind, to foist stock upon the community. More than a generation ago peat as commercial fuel received a great deal of attention, and much money was spent in the attempt to put its production upon a satisfactory basis. At that time peat producing companies were formed, the public bit greedily and, the promoters selling out, the bubbles burst one after the other, until the name peat became obnoxious to hundreds of citizens who had seen their money go to no good. The attempt to make peat a popular fuel failed, though its use for special purposes, especially in its charcoal form, continued as it had existed previously for a long time. To-day many good minds are working on the problem and excellent results are reported. It seems quite possible that the large stores of peat which are contained in bog land all over the East and in other parts of the country will eventually be put to good use as fuel salable at a reasonable price. Doubtless processes known to-day are sufficiently practicable to accomplish the desired object. Nevertheless, we are informed by those



who have become interested in the peat question that companies projected, and perhaps by this time organized, are making claims of quick riches based upon premises that are not borne out by facts.

### Growth of Public Manual Training Schools.

The public school system of the country has been repeatedly charged with the sin of unfitting the rising generation from working with its hands, while it fitted it for nothing in particular. This charge is most frequently lodged against our public high schools, which annually graduate thousands of young people with aspirations toward the professions, who finally find their ways into cheap clerical positions, because there is nothing else that they know how to do.

To correct this evil, for evil it is, wise boards of education in the larger cities and towns are making provision for manual training departments to existing public schools, and in some instances to separate public manual training schools. It has resulted in the training of the hand and eye, developing the judgment of the American youth, instilling into their minds the dignity and worth of manual labor, and fitting them, upon graduation, to step onto one of the lower rounds of our industrial ladder, with the attitude toward useful work and the skill and taste that will permit them to rise to greater heights.

It is true that most of these young graduates will, for a time, find it difficult to secure work in our shops and mills because of the dominance of the labor union system and its unreasonable rulings in regard to apprentices; but that is only a transient condition which is steadily growing less serious; and the very presence of the alert young minds and trained willing hands of graduates of these manual training schools, clamoring for employment, will tend, year by year, to lessen the arbitrary power of trades unionism. We may even hope that this new force will hasten the coming of the industrial millennium when personal skill, industry and good habits, rather than a celluloid button, will be the open sesame to the doors of employment in the trades and industries.

## OBITUARY.

DAVID E. WHITON.

David E. Whiton, founder of the D. E. Whiton Machine Company, New London, Conn., died, September 12, at his residence at New London, after a brief illness following a long period of poor health. He was born in Stafford, Conn., in 1825, and at the age of 14 was apprenticed as a carpenter. Purchasing a part of his time, he left his employer before coming of age and went to Chicago, then a small town. Not liking the Western life, he returned to Connecticut and found employment as a pattern maker at Hartford. Returning to Stafford, he taught school for a while and then established a shop for the manufacture of a turbine water wheel of his own design. This and other inventions of machinery formed the basis of the present Whiton business. In 1883 he established a branch shop at New London and soon afterward the entire business was moved to that city, where it prospered, and at the present time occupies a large modern plant. He maintained an active part in the management until within a few days of his death. His inventive genius continued to manifest itself even in recent years. He took up the camera and built several which contained ideas of his own. A patent on a new developing tray is now pending at Washington. He served in the first Legislature that sat in the new State capitol at Hartford. He leaves a son, L. E. Whiton, secretary and treasurer of the D. E. Whiton company.

### NOTES.

EDWARD P. BRUCE RUFF, president of the Kelton, Bruce Belting Company, Salem, Mass., died at Salem,

September 16, aged 50 years. After partial courses at Harvard in the academic department and Medical School, he engaged with his uncle in the leather business, which later merged into the Kelton, Bruce Belton Company. He was the inventor of several machines.

ALLEN BOUCHER, secretary and treasurer of the Caldwell Manufacturing Company, Rochester, N. Y., died at his residence in that city, Wednesday evening, September 14.

OLIVER WILLIAMS of Catasauqua, Pa., died September 17, aged 74 years. Mr. Williams was for a quarter of a century president of the Catasauqua Manufacturing Company. At the time of his death he was president of the Cement National Bank of Slegfried, Pa.; vice-president of the Whitehall-Portland Cement Company and president of the Bryden Horse Shoe Works. Mr. Williams was also for three years president of the National Iron Association and for 15 years president of the Eastern Iron Association.

OSCAR B. WEBER, a well-known engineer and inventor of improvements on furnaces and gas houses, died September 16, in New York city, as the result of an operation. He was 45 years old and was much interested in music.

J. MCGREGOR ADAMS, president of the Adams & Westlake Company, died September 17 at his residence in Highland Park, Chicago. He was 70 years old, and was born in Londonderry, N. H., and educated at Andover. In 1858 he went to Chicago to represent the hardware house of Morris K. Jesup & Co. He soon afterward became associated with John Crerar, who was employed by the same firm, and in a few years the two became the owners of the business, under the firm name of Crerar, Adams & Co. After the death of Mr. Crerar the corporation assumed its present name. Mr. Adams also was heavily interested in the American Bridge Company until that company was merged into the present corporation.

CAPT. HENRY F. JENKS, inventor and manufacturer of metal goods and plumbing supplies, died at his home in Pawtucket, R. I., September 11, aged 67 years. He was a member of the well-known Jenks family, which has been identified with Rhode Island industries for many years. He was a veteran of the Civil War, and afterward held an important office in the Rhode Island militia, serving for a time as provost marshal of the Rhode Island brigade.

J. B. RAMP, for nearly 25 years foreman and superintendent of the foundry of the Murray Iron Works, at Burlington, Iowa, is dead at the age of 74. Mr. Ramp was born in New York City, and was a soldier in the Civil War.

MICHAEL SCHALL, head of the Keystone Foundry & Machine Company, York, Pa., was found dead on September 19, under circumstances that point to suicide. He had been suffering from a nervous affection, which, it is thought, was the cause of his having taken his own life.

ALEXANDER VAN SICLEN, proprietor of A. Van Siclen & Co., 8 South Canal street, Chicago, died September 17. Mr. Van Siclen's firm was Western representative of the Atlas Engine Works, besides doing a general business in engineering supplies.

**Republic Contract for Sheet and Tin Bar Mills Placed.**—PITTSBURGH, PA., September 21, 1904.—It is understood, but not officially confirmed, that the Republic Iron & Steel Company has placed a contract with the United Engineering & Foundry Company for the building of mills at the Bessemer works at Youngstown, Ohio, for the rolling of sheet and tin bars. The mills will be interchangeable, so that either sheet and tin bars or steel rails can be rolled. The mills will have a daily capacity of about 1200 tons, and are expected to be ready for operation in April next.

Bids for the battle ship "New Hampshire" and the armored cruisers "Montana" and "North Carolina" will be opened at the Navy Department, Washington, on November 15.

## The Coal Trade.

BY FREDERICK E. SAWARD.

### The Coal Trade of the World.

The world's progress in coal output and consumption is interesting, for the yearly figures now run up to 790,000,000 tons of 2240 pounds. The United States is at the head, with 100,000,000 tons in excess of Great Britain's 230,000,000 tons. It is worthy of note that, in spite of the enormous coal production of the United States, its exports of this commodity are comparatively unimportant and do not appear to be increasing very rapidly. This, of course, is a natural outcome of its enormous home demand, and supports the view that national prosperity is more concerned with the utilization than with the export of its raw material. The consumption of coal in some of the chief consuming countries is shown in the following statement, in which the countries are given in the order of importance as coal consumers:

	1903.—Tons.
United States.....	316,029,000
United Kingdom.....	166,532,000
Germany.....	103,114,000
France.....	46,580,000
Russia.....	18,374,000
Belgium.....	21,432,000

It will be seen from these figures that the total consumption of coal in the United States is now nearly twice as great as in any other country.

### Improving Trade Prospects in the United States.

So much for retrospect, and now as to the present and future condition of this trade in the United States. The dullness of the summer has passed away, and it may be stated that there is an improving tone to trade. The fact that the time is now at hand, or approaching, when coal is wanted for actual use induces a change in opinion of trade conditions, as against anything which has been heard during the past few weeks. It is evident enough that coal will be wanted in the usual large quantity, for all purposes, during the next six months, and there is no doubt that those consumers who wish to gain peace and comfort will put it away as early as possible. This is good advice, for the carrying companies are not much better prepared for handling traffic than they were a year ago, and there are other articles of merchandise besides coal. It is evident, from the reports which come to hand, that the move toward better things is gradually increasing in volume, and one must remember that the course of events in this country is seldom backward. The tonnage of coal of all kinds last year was a large one, and of great value in every way; but with more settled conditions and lower values prevailing, there is not so much reason for complaint of the situation as a whole as some imagine. The fuel industry has been long misunderstood, by reason of ignorant criticism, but the gain along the line of its importance to the country is appreciable. Railroad companies find in it a large share of their prosperity, and this will grow as time goes along, while the markets are steadied by the fact that larger and more intelligent interests are now in control (or are becoming the controllers), and the public is being served at reasonable rates.

### The Anthracite Outlook.

The tonnage of anthracite for eight months was 38,212,288 tons, as compared with about 42,430,000 tons last year. For the eight months ended August 31 the shipments of anthracite coal by the various anthracite roads were larger than in the corresponding period in any previous year with the exception of 1903. The total shipments so far in 1904 are approximately 4,000,000 tons less than in the same time in 1903, although they exceed 1902 by nearly 19,000,000 tons and are 3,500,000 tons in excess of 1901. The small shipments in 1902 were due to the strike. The results for the eight months indicate that 1904 will go on record as one of the best in the history of the anthracite coal industry. The statistics show the following as the shipments of each interest:

Company	Tons.—1904.
Philadelphia & Reading.....	7,440,188
Lehigh Valley.....	6,220,981

Central Railroad of New Jersey.....	4,836,166
Delaware, Lackawanna & Western.....	6,129,249
Delaware & Hudson.....	3,712,029
Pennsylvania Railroad.....	3,185,835
Erie.....	3,912,514
Ontario & Western.....	1,771,453
Delaware, Susquehanna & Schuylkill.....	1,003,873

It is said that the proportion of steam sizes of anthracite, putting pea in the list, comes at about one-third, and the low prices made this season on these are owing to the cheapness of bituminous coals of all grades. With an output of this fuel five times that of the total of hard coal, it is not to be wondered at that prices in time of depression such as the past season has witnessed should be cut to cost of production.

### The Bituminous Market.

The bituminous market is still quiet, but there is a better tone and more inquiry for coal. Mills are starting up in all directions, and there will be a large increase in the use of bituminous coal this fall over the past summer. Prices remain on a low basis, and coal is still offering at prices that give no one any profit, for there cannot be anything in it at the range of \$1.15 at the mines, at which certain coal has sold. Steam users are showing some inclination toward making contracts, and, while this is not very strong, they begin to feel that there may be a difference later on, and that it would be better to have some kind of a figure on what they use. Steam coal has been plentiful, but with increased activity in the business it will be more difficult to handle later on. More coal is being used than in the past, as a number of the factories throughout the country are opening up. As a rule, it is not very long after the "big fellows" start before the "little ones" think it is a good plan to get in some coal, and with the talk of car shortage, which has already commenced, it is advisable for the buyer to get in his orders now to get the most satisfactory treatment and the lowest price. The market is already stiffening on some of the better grades of Pennsylvania coal. The districts shipping from Hampton Roads and Baltimore have taken a great deal of trade this year, which is shown by the traffic returns, Norfolk & Western and Chesapeake & Ohio having made gains of 30 per cent. in some recent months. It is the remarkable development of the cheaply mined coal of the Virginias that has made this possible, and the Pennsylvania operators made figures that, as stated above, did not represent cost. While this is very interesting to the consumer, the fact remains that the producer has suffered, and the probable activity in general business this fall and winter, now said to be setting in, is the cheering sign for him; the average rate for the year will hardly be up to normal—that is, to figures realized before the boom set in a year or so ago.

**The Reading Buys an Interest in the Pennsylvania Steel Company.**—The Philadelphia & Reading Railway Company has acquired an interest in the Pennsylvania Steel Company, according to the annual report of President George F. Baer. Mr. Baer says: "The Reading Iron Company (the whole of which stock is owned by the Reading Company), in addition to paying a regular 6 per cent. dividend on its capital stock, has out of its earnings during this period rebuilt its entire plant, and it is now one of the most modern and best equipped iron plants in the State. And it has also acquired a large interest in the Pennsylvania Steel Company, so that not only is the success of this iron plant reasonably assured, whereby a very large traffic is secured to the company, but with these expenditures the iron company will in the near future be in a position to increase its dividends to your company."

Some excellent records in output of billets have recently been made in the Clairton open hearth works of the Carnegie Steel Company, at Clairton, Pa. In one hour recently this plant turned out 107 tons of 4 x 4 inch billets, and in a similar time the plant turned out 104 tons of 4 x 4 inch billets. These are said to be record runs for billets of this size.



## Invention.\*

### A Discussion of the Hindrances to Its Advancement.

The great inventions of the last century in science and the arts have resulted in a large increase of knowledge and the powers of man to harness the forces of Nature. These great inventions have proved that inventors have been among the greatest benefactors of the human race. Yet the lot of the inventor until recent years has been exceptionally trying, and even in our time I scarcely think one would describe it as altogether a happy one. The hostility and opposition which the inventor suffered in the Middle Ages have certainly been removed, but he still labors under serious disability in many respects under law as compared with other sections of the community. The change of public feeling in favor of discovery and invention has progressed with rapidity during the last century. Not only have private individuals devoted more time and money to the work, but societies, institutions, colleges, municipalities and governments have founded many research laboratories, and in some instances have provided large endowments. These measures have increased the number of persons trained to scientific methods, and also provided greatly improved facilities for research; but perhaps one of the most important results to engineers has been the direct and indirect influence of the more general application of scientific methods to engineering.

#### What an Invention Is, and How It Is Developed.

Generally, what is usually called an invention is the work of many individuals, each adding something to the work of his predecessors, each suggesting something to overcome some difficulty, trying many things, testing them when possible, rejecting the failures, retaining the best, and, by a process of gradual selection, arriving at the most perfect method of accomplishing the end in view.

Then, after the invention, there follows the perfecting of the invention for general use, the realization of the advance or its introduction commercially. This after-work often involves as great difficulties and requires for its accomplishment as great a measure of skill as the invention itself.

If the invention competes with or is intended to supersede some older method, then there is a struggle for existence between the two. Thus it often occurs in the history of inventions that the surroundings are not favorable when the first attack is made, and that subsequently it is repeated by different persons, and finally, under different circumstances, it may eventually succeed and become established.

We may take in illustration almost any of the great inventions of undoubted utility of which we happen to have the full history; for instance, some of the great scientific discoveries, or some of the great mechanical inventions, such as the steam engine, the gas engine, the steamship, the locomotive, the motor car, or some of the great chemical or metallurgical discoveries. Are not most, if not all, of these the result of the long continued labor of many persons, and has not the financial side been, in most cases, a very important factor in securing success?

In the history of great mechanical inventions there is, perhaps, no better example of the interdependence of the engineer, the physicist and the chemist than is evinced in the perfecting of the gas engine. The physicist and the chemist determine the behavior of the gaseous fuel, basing their theory on data obtained from the experimental engines constructed by the mechanical engineer, who, guided by their theories, makes his designs and improvements; then, again, from the results of the improvements fresh data are collected, and the theory further advanced, and so on till success is reached. Though I have spoken of the physicist, the chemist and the engineer as separate persons, it more generally occurs that they are rolled into one or two individuals, and that it is indispensable that each worker should have some con-

siderable knowledge of all the sciences involved to be able to act his part successfully.

#### How the Development of an Invention Might Be Furthered.

Could not this very valuable invention—the internal combustion engine—have been introduced in a much shorter time by more favoring circumstances, by some more favorable arrangement of the patent laws, or by legislation to assist the worker attacking so difficult a problem? I think the answer is that a great deal might be done, and I will endeavor to indicate some changes and possible improvements.

What a waste of time, expense and disappointment would be avoided if we in England helped the patentee to find out easily what had been done previously, on the lines adopted by the United States and German Patent Offices, who advise the patentee, after the receipt of his provisional specification, of the chief anticipatory patents, dead or alive. And ought we in England to rest content to see our patentees awaiting the report of the United States and German Patent Offices on their foreign equivalent specifications before filing their English patent claims? Ought not our Patent Office to give more facilities and assistance to the patentee?

#### The Present Condition.

Consider the position of the inventor—the man anxious to achieve success where others have hitherto failed. To be successful he must be something of an enthusiast; and usually he is a man of moderate means, dependent on others for financial assistance. Generally the problem to be attacked involves a considerable expenditure of money before any return can thereby accrue, even under the most favorable circumstances. In the very few cases where the inventor has some means of his own they are generally insufficient to carry him through, and there have, unfortunately, been many who have lost everything in the attempt. In nearly all cases the inventor has to co-operate with capital.

The combination may be successful and lasting, but unfortunately, the best inventors are often bad men of business. The elements of the combination are often unstable, and the disturbing forces are many and active; especially is this so when the problem to be attacked is difficult, necessitating various and successive schemes involving considerable expenditure, generally many times greater than that foreshadowed at the commencement of the undertaking. Under such circumstances, unless the capitalist be in entire sympathy with the inventor, or exercises great forbearance, stimulated by the hope of ultimate success and adequate returns, the case becomes hopeless, disruption takes place, and the situation is abandoned. Further, in the majority of cases, after some substantial progress has been made, it is found that under the existing patent laws insufficient protection can be secured, and the prospect of a reasonable return for the expenditure becomes doubtful. Under such circumstances the capitalist will generally refuse to proceed further unless the prospect of being first in the field may tempt him to continue.

Very many inventors, as I have said, avoid the expense of searching the patent records to see how far their problem has been attacked by others. In some cases the cost of a thorough search is greater than the cost of a trial attack on the problem. In the case of young and inexperienced inventors there sometimes exists a disinclination to enter on an expensive search; they prefer to spend their money on the attack itself. There are some who have a foolish aversion to take steps to ascertain if others have been before them, and who prefer to remain in ignorance and trust to chance. It will, however, be said that the United States and German Patent Office reports ought to suffice to warn or protect the English patentee; but my own experience has been that such protection is not entirely satisfactory. There is a considerable interval before such reports are received, and the life of a patent is short. Then, if the patent is upon an important subject, attracting general attention, the search is vigorous and sometimes overwrought, and the patent unjustly damaged or refused altogether. If the patent is on some subject not attracting general attention, it

\* Abstract from an address delivered before the Engineering Section of the British Association for the Advancement of Science by Charles A. Parsons, president of the section, August 18, 1904.

receives too little attention, and is granted without comment.

In some few instances ignorance has been a positive advantage, and if the patentee had realized how much of his patentable work was honeycombed by previous publications and patents he would have lost heart and given up the task. It is a case of the exception proving the rule; and the patentee ought to know his true position and make his choice accordingly. The present patent law has some curious anomalies. Let us suppose some inventor has the good fortune to place the keystone in the arch of an invention, to add some finishing touch which makes the whole invention a complete success, and valuable. Then others try to reap the results of his labor and good fortune, and often it is discovered after laborious search that someone else first suggested the same keystone in some long forgotten patent or obscure publication, but for some reason the public were none the better for his having done so. The law says this is an anticipation, and instead of apportioning to all parties reasonable and equitable shares in the perfected invention, to which no one could object, it says that the patent is injured, or rendered useless by the anticipation, and that its value to every one concerned is thereby diminished or destroyed and it is thrown open to the public. Up till a few years ago any anticipations, however old, might be cited, but recently the law has been amended, and at present none rank as anticipations which are more than 50 years old.

Capital having been found, the next difficulty is in the conservatism of the buyers of the invention. There is always present in their minds the risk of failure, and in the event of success the advantage, in their estimation, may not counterbalance the risk. In large departments and companies, whose management is conducted by officials receiving fixed salaries acting under nontechnical supervision, there is a strong tendency among the officials to leave well enough alone, the organization being such that the risk of failure, even though remote, more than counterbalances, in their estimation, the advantages that would result in the event of success. Next is the opposition of those who are financially interested in competing trades or older inventions; and if the invention is a labor saving appliance, then the active opposition of the displaced labor is a serious, though generally only a temporary, barrier.

Fortunately for the community, for research and for invention, there is always to be found a considerable percentage of persons who are able and willing to risk, and, indeed, to sacrifice, their personal interests in the cause of progress for the benefit of the community at large; and were it not for such persons the task of the introduction of most inventions would be impossible.

#### **Instances of the Lack of Patent Protection.**

There are many problems of the highest importance in physics, engineering, chemistry, geology and the arts of which the investigation might probably prove of great benefit to the human race, and of which the probable monetary cost of the attack would be considerable. It is possible in the case of some of the more attractive problems that a group of rich philanthropists might be found, but in most cases it would be impossible to form a company on business lines under the existing laws of this and other countries.

In the case of many problems, no patents will give adequate protection; in some cases there is no subject matter of novelty and importance involved. In other cases the probable duration of the investigation is so long that any initial patents would have expired before a commercial result was reached, and under either of these circumstances there would be no inducement to financiers to undertake the risk.

As an illustration of my meaning, I will take the thorough investigation of the problem of aerial navigation. This problem could undoubtedly be solved by an organized attack of skilled and properly trained engineers and the expenditure of a large sum of money. Assuming the problem solved, and commercially successful, it appears to be impossible under the existing patent laws to secure any adequate monopoly to justify the expectation of a reasonable return on the capital expended.

For in view of the multitude of suggestions that have been made and the experiments that have been carried out, the practical solution of the problem would appear to rest on a judicious selection of old ideas by means of exhaustive experiments.

#### **A Remarkable Project That Might Be Made Possible.**

Another and, perhaps, more important investigation which has not as yet been attacked to any material extent is the exploration of the lower depths of the earth. At present the deepest shaft is, I believe, at the Cape, of a little over one mile in depth, and the deepest bore hole is one made in Silesia, by the Austrian Government, of about the same depth. What would be found at greater depths is at present a matter for conjecture, founded on the dip and thickness of strata observed on or near the surface. Much money and many valuable lives have been devoted to exploration of the polar regions, but there can be no comparison between the scientific interest and the possible material results of such exploration and the one I have chosen for illustration of the inadequate protection afforded by law—namely, a great engineering attack on a problem of geology.

An exploring expedition into a new country has before it generally the probability of the acquisition of territorial and mineral rights or possessions bringing material gain to the undertakers. The rights of such enterprises are well known, and capital can be obtained, with or without national support. On the other hand, the explorer into the depths of the earth has no rights or monopolies beyond the mineral rights of the land he has purchased over his boring; further, it is improbable that he can obtain any patent of substantial value for his methods of boring to great depths. To succeed in the undertaking a great expenditure of money must be incurred, far greater than that of the exploring expedition, and to raise this sum the pioneers have practically no security to offer. For if they succeed in finding rich deposits of precious minerals in greater abundance, or succeed in making some geological discovery associated with deep borings, they gain no exclusive title to these under existing laws. Any other person or syndicate acting upon the experience gained could sink other shafts in other places or countries, and, benefiting by the experience gained by the pioneers, could probably carry out the work more advantageously, and thus depreciate the first undertaking or render it valueless, as has often occurred before.

Sinking a shaft to a great depth presents no insurmountable difficulties beyond those incidental to an enterprise of considerable magnitude, involving the ordinary methods of procedure adopted by mining engineers. There would be some departures from ordinary practice on account of the great depth, but these are more of the character of detail. On the design of this boring I have consulted John Bell Simpson, the eminent authority on mining in the North of England. The shaft would be sunk in a locality to avoid as far as possible water bearing strata and the necessity of pumping. It would be of a size usual in ordinary mines or coal pits. The exact position of such shaft would require some consideration as to whether it should commence in the primary or secondary strata. It would be sunk in stages, each of about half a mile in depth, and at each stage there would be placed the hauling and other machinery, to be worked electrically, for dealing with each stage. The depth of each stage would be restricted to half a mile in order to avoid a disproportionate cost in the hauling machinery and the weight of rope, as well as increased cost in the cooling arrangements arising from excessive hydraulic pressures. At each second or third mile in depth there would be air locks to prevent the air pressure from becoming excessive owing to the weight of the superincumbent air, which at from two to three miles would reach about double the atmospheric pressure at the surface. A greater rise of pressure than this would be objectionable from the inconvenience to the workmen and the rise of temperature due to the adiabatic compression of the circulating air for ventilating purposes. The air pressure immediately above each air lock would thus reach to about two atmospheres, and beneath to one atmosphere. In order to carry on the transfer of air



through the air locks for ventilating purposes pumps coupled to air engines would be provided, the energy to work the pumps being obtained from electro-motors. To maintain the shaft at a reasonable temperature at the greater depth powerful means of carrying the heat to the surface would be provided.

The most suitable arrangement for cooling would probably consist of large steel pipes, an upcast and a downcast pipe, connected at the top and bottom of each half-mile section in a closed ring. This ring would be filled with brine, which by natural circulation would form a powerful carrier of heat; but the circulation, assisted by electrically driven centrifugal pumps, would be capable of carrying an enormous quantity of heat upward to the surface. At each half-mile stage there would be a transfer of the heat from the ring below to the ring above by means of an apparatus similar in construction to a feed water heater, or to a regenerator constructed of small steel tubes, through which the brine in the ring above would circulate, and around the outside the brine in the ring below could also circulate, the heat being transmitted through the metal of the tubes from brine ring to brine ring.

One arrangement would be to cool the brine to a very low temperature in the top ring at the mouth of the shaft by refrigerating machinery, so as to provide a sufficient gradation of temperature in the whole brine system to insure the necessary flow of heat upward from brine ring to brine ring, and overcome all the resistances of heat transfer, and so maintain the lowest ring at the temperature necessary for effectual cooling of the lowest section of the shaft. But a better arrangement would be to place powerful refrigerating machinery at certain of the lower stages, the function of this machinery being to extract heat from the ring below and deliver it to the ring above. This latter method would increase to a very great extent the heat carrying power of the system, which in the first arrangement is limited by the freezing temperature of brine in the descending column and the highest temperature admissible in the ascending brine column. The amount of heat conducted inward through the rock wall and requiring to be absorbed and transferred to the surface depends on the temperature and conductivity of the strata. But there is no doubt that the methods I have indicated would be capable of maintaining a moderate temperature in the shaft to depths of 12 miles.

During the process of sinking at the greater depths the shaft bottom would require the application of a special cooling process in advance of the sinkers, similar to the freezing system of M. Poetsch, used for sinking through water bearing strata and quicksands, and now in general use. It consists in driving a number of bore holes in a circle outside the perimeter of the shaft to be sunk; through these bore holes very cold brine is circulated, thus freezing the rocks and quicksands and the water therein, and when this process is completed the sinking of the shaft is easily accomplished.

This process would be maintained not only on the shaft bottom, but also for some time on the newly pierced shaft sides, until the surrounding rock had been cooled for some distance from the face.

As to the cost, rate of boring and normal temperature of the rock, an approximate estimate has been made, based on the experience gained on the Rand, but including the extra costs for air locks and cooling:

Cost.	Temperature	
	Time in of rock.	years. Deg. F.
For 2 miles depth from the surface. \$2,500,000	10	122
For 4 miles depth from the surface. 5,500,000	25	152
For 6 miles depth from the surface. 9,000,000	40	182
For 8 miles depth from the surface. 13,500,000	55	212
For 10 miles depth from the surface. 18,500,000	70	242
For 12 miles depth from the surface. 25,000,000	85	272

My main object in discussing the enterprise at some length has been to show that a pioneer company would not acquire any subsequent monopoly of similar works under the existing patent laws or the laws of any country.

In the scheme there appears to be nothing that could be patented; but let us suppose that some good patent

could have been found that was absolutely essential to the success of the undertaking, it would certainly have expired before the pioneer company could have reaped any substantial return, and probably before the first enterprise had been completed. It follows, therefore, that at the present time there is no adequate protection, or, indeed, any protection at all, for the promoters of many great and important pioneer enterprises, some of which might prove of immense benefit to mankind.

#### Proposed Remedies.

What change in the laws would place great pioneer research works on a sound financial basis? A government grant, except for very special purposes, seems to be out of the question, seeing that the benefits to be derived are generally not confined to any one country. An extension of the life of patents, which is now from 14 to 16 years in different countries, would be undoubtedly a step in the right direction. It would be of great benefit if some scale of duration of patents could be fixed internationally, according to the subject matter, the difficulty of the attack and the past history of the subject, but more especially in view of the utility of the invention.

One of the chief objections raised by the Privy Council against the extension of patents in this country has rightly been that undue prolongation is unfair to the British public, seeing that abroad no prolongations are granted. Therefore, if the duration of patents for important matters is to be extended at home, it must also be extended abroad. Such prolongations should be international, and concurrent in all the countries interested. One solution would be to place such matters under the jurisdiction of a Central International Committee, who would have the apportionment of the life and privileges of patents and of the extension or curtailment of their duration, according to their handling by the owners. Why has a patent a life of only 14 to 16 years, while copyright is for 42 years? Why has a pioneer company making a railway under Act of Parliament generally rights forever unless it abuses its privileges, or the requirements of the district necessitate the construction of competing lines, while a patent has, in comparison, a life of infinite shortness?

I might also cite gas companies, electrical supply companies, under Act of Parliament or Provisional Orders of 42 years' duration. Until the term of life for electric supply companies had been extended from 21 years to 42 years by the Bill of 1884, it was impossible to find capital for such undertakings.

A patent, to be fair to the patentee, ought, in many cases, to be analogous to an Act of Parliament or a Provisional Order. Would it not place matters in a fairer position, especially in the case of expensive and lengthy researches, to grant to those who pledged themselves to spend a suitable minimum sum within a stated period on the research a reasonable and fair monopoly, so that such person or syndicate might, in the event of success, be in the position to reap a reasonable return for their expenditure and risk?

Some such measure would unquestionably give an immense stimulus to research and invention by enabling capital to be raised and works started on commercial lines in fields of great promise at present almost untouched.

In conclusion, let us hope that the inventor will in the future receive more encouragement and support, that the patent laws will be further modified and extended, that the people at large will consider these matters more closely, and recognize that they are of first importance to their progress and welfare, and that in the future it may be possible to carry on many great researches into the secrets of nature.

At the annual meeting of the Thomas Iron Company the following were re-elected to the Board of Directors: Samuel Thomas, Wm. H. Hulick, W. P. Hardenbergh, F. R. Drake, B. F. Fackenthal, J. S. Rodenbough and J. S. Kraus. The board re-elected the following officers: President, B. F. Fackenthal; vice-president, Wm. H. Hulick; secretary and treasurer, Jas. W. Weaver.

## MANUFACTURING.

### Iron and Steel.

The American Sheet & Tin Plate Company, Pittsburgh, is considering the matter of removing its Star tin plate plant from Twelfth street, Pittsburgh, to New Kensington, Pa., where the Pittsburgh and Pennsylvania tin plate works are located. However, a definite decision in this matter has not been reached. The company is completing the Sharon plant at South Sharon, Pa., by which sheet and tin plates will be rolled under the Bray process. This process will do away with a large amount of labor and effect a very material saving in cost of making both sheets and tin plate.

The Ulster Iron Works, Dover, N. J., has resumed operations after a two months' shut down. The work on the addition to the mill for the new heating furnaces is progressing favorably.

The second stack of the Empire Steel & Iron Company, Reading, Pa., has been blown in and in a month the furnace at Top-ton will resume operations.

The iron ore mines of the Newark Mining Company, near Allentown, Pa., the product of which is used largely by the Thomas Iron Company, Reading, Pa., will be sold to satisfy wage claims, the miners having quit work on July 1 with two months' wages due them. Sixty per cent. of these claims have been paid and the remainder will be realized by the sale of the company's property.

A Philadelphia syndicate represented by George S. Cosden has purchased and will operate the rolling mills of the McCullough Iron Company, at North East, Md.

On the site of the old Chattanooga Furnace, Chattanooga, Tenn., which was formerly operated by the Chattanooga Furnace Company, a new stack is to be erected by C. E. Buek and associates of Birmingham, Ala., and the plant is to be otherwise improved to make it strictly modern in every respect. Preliminary plans call for a furnace of 125 tons capacity per day. All the necessary machinery has been secured.

The Laughlin Works of the American Sheet & Tin Plate Company, at Martins Ferry, Ohio, has been closed down for some little time, with no immediate prospects of resumption. This is one of the largest plants owned by the American Sheet & Tin Plate Company and contains 23 hot and 22 cold mills, the output being black plates for tinning, tin and terne plates, and the annual capacity is 50,000 gross tons.

The Martins Ferry department of the Whitaker-Gleesner Company, Martins Ferry, Ohio, manufacturers of steel and iron sheets, is being operated to full capacity, and the concern expects to continue running the plant full time right along. This sheet plant contains four hot and four cold mills, the annual capacity being 15,000 gross tons of sheets.

Soho Furnace of the Jones & Laughlin Steel Company, Pittsburgh, was blown in last week. The furnace is 19 x 80 feet in size and has an annual capacity of about 125,000 tons. During the shut down the furnace was not only relined, but new blowing engines were installed, which will considerably increase the output of the stack. The third converter in the Bessemer plant of the same company, on the South Side, Pittsburgh, was started last week, and the plant is now in operation to full capacity. The Talbot open hearth furnace has been relined and was started up again last week. During a run of ten weeks this furnace was tapped 353 times, the output having been slightly in excess of 18,000 tons of steel. The company has decided to add one and possibly two more Talbot furnaces to the plant.

Brown & Co., Incorporated, proprietors of the Wayne Iron & Steel Works, Pittsburgh, will increase the output of their finishing department by the addition of a 20-inch train, on which skelp sizes can be rolled. The contract for a 26 x 42 inch piston valve engine and also for the train has been placed with the Mesta Machine Company, Pittsburgh.

No. 2 furnace of Shenango Furnace Company, at Sharpsville, Pa., was blown out last week for relining and other repairs. Four Massicks & Crookes hot blast stoves are being added to this plant by George W. McClure, Son & Co., Bessemer Building, Pittsburgh, who are sole agents in this country for this type of stove.

The plant of the Cuyahoga Wire & Fence Company, at New Castle, Pa., is being dismantled and the machinery is being sold. The real estate and buildings have not yet been offered for sale.

The buildings under construction at Lorain, Ohio, for the National Tube Company have been practically completed. There are 22 buildings in all. The work of installing the heavy machinery is now in progress. It is expected that the first of the year will see the plant in operation.

The Garry Iron & Steel Company, Cleveland, is building a special revolving pneumatic crane, fitted with six ore buckets, for the Kansas City Southern Railroad Company. The company reports a very pronounced improvement in its roofing business. It has a contract from the Belt Line Railway & Stock Yards Company, Indianapolis, for covering buildings, each 80 x 240 feet, with 200 tons of genuine charcoal iron, galvanized, a product which has been used by this company in roofing for many years. It is claimed that it is entirely free from manga-

nese and that it will not rust. The company recently tested some of this roofing, which had been on a building for 41 years, and it was found to be in practically as good condition as the day it was put on.

For the fourth time within a year the plant of the Zanesville Iron Company, Zanesville, Ohio, was offered for sale last week by Master Commissioner T. F. Spangler. The appraised value of the plant was \$36,000, and the lowest figure at which it could be sold was \$24,000. But there were no bidders, as was the case on previous occasions. It will be reappraised and again offered for sale.

The Youngstown Iron Sheet & Tube Company, Youngstown, Ohio, has broken ground for the new lap weld tube mill, which will make pipe up to 16 inches in diameter. Plans for this mill were drawn by S. V. Huber & Co., consulting engineers.

### General Machinery.

The Goulds Mfg. Company, Seneca Falls, N. Y., has purchased about 40 acres of land adjacent to its No. 2 works, which will be used for extending the present plant. It is not unlikely that the entire plant will be concentrated on the new site, which is located along the tracks of the New York Central Railroad, as the company is much in need of increased manufacturing facilities.

The C. O. Bartlett & Snow Company, Cleveland, Ohio, has lately closed a contract for a complete elevator machinery outfit for the new plant of the Sheet Bros. Elevator Company, Cleveland. Orders have also been received from Levi Cohn & Bros., Lancaster, Pa., for a 72-inch Triumph steam dryer; Ohio Retarder Company, Port Clinton, Ohio, one 72-inch Triumph steam dryer, and Good Roads Machinery Company, Uniontown, Pa., one elevating outfit.

Niel Gray, Jr., proprietor of the Oswego Machine Works, Oswego, N. Y., has purchased a piece of property, 100 x 165 feet, adjoining his plant, which will probably be used for increasing the facilities.

The car building plant of the British Columbia Electric Railway Company at New Westminster, B. C., which was destroyed by fire August 13, is being rebuilt on a somewhat larger scale. The main building will be 75 x 180 feet, with office, boiler room and paint shop annexes. The building will be of mill type, flat roof and very substantial. A full equipment of wood and iron working machinery will be installed, orders for which have already been placed. The power will be electrical, taken from the company's commercial circuit. It is expected the plant will be in operation by November 1.

The L. Hardy Company, manufacturer of machine knives, Worcester, Mass., is erecting a new boiler house in which a 150 horse-power boiler built by the Stewart Boiler Works, Worcester, will be installed.

The name of the Scott & Oliver Mfg. Company, Knoxville, Tenn., has been changed to the Wm. J. Oliver Mfg. Company, and the charter amended so as to increase the capital stock from \$50,000 to \$100,000. Alex. McMillen and Alex. A. Scott, of the original company, have sold their interests to Wm. J. Oliver, and he has assumed active control and operation of the plant, greatly improving and enlarging it. The new company will manufacture a complete line of clay, mining, dump and contractors' cars, hoisting engines, light locomotives, brick machines, the Scott's patent brick car and drying equipment, together with wheelbarrows, &c. The company has improved the Scott's system for handling and drying brick, having secured exclusive control of these patents, and will put this system on the market in connection with its other lines. The officers are Wm. J. Oliver, President; L. C. Gunter, secretary and treasurer, and W. W. Wallace, general superintendent.

The Grant Mfg. & Machine Company, Bridgeport, Conn., recently incorporated with a capital stock of \$50,000, has moved into its new factory building, 90 Silliman avenue, where it hopes to be able to handle the increased business advantageously. The company manufactures bench screw slotting machines, tool post grinding outfits, bench filing machines, speed lathes, multiple spindle tapping machines and special machinery to order, besides doing contract work on typewriter, car-fare, cash register and envelope sealing machines and various coin controlled machinery.

The Baltimore & Ohio Railroad will spend about \$700,000 in improving the terminal and dock facilities at Cleveland, making this one of the most important terminals on the system. It is the intention to install modern ore and coal handling machinery on its docks. Leading officials of the company will make an inspection of the Cleveland terminals this week with a view to deciding upon the improvements.

The Williamsport Clutch & Pulley Company, Williamsport, Pa., has just received the contract for supplying a complete outfit of elevating and conveying machinery for the International Acheson Graphite Company, Niagara Falls, N. Y.

The entire equipment of machinery of George E. Lloyd & Co.'s plant at Elkhart, Ind., which was sold by the Chicago Title & Trust Company, receiver, was bought by the J. H. Dawson Machinery Company, Chicago. The plant includes more than 100 machines, such as lathes, milling machines, screw machines, planers, shapers, drill presses, &c., such as were used in



the manufacture of machinery for printers and stereotypers. The purchaser will make an effort to dispose of the equipment as a whole before considering propositions for the sale of any individual pieces.

The Gunnell Tool Company, Manitowoc, Wis., has been organized to manufacture pneumatic tool specialties, such as pneumatic rivet heating forges, pneumatic hose couplings, riveting machines, &c. The company is making a specialty of forge and hose coupling. The incorporators of the company, which is capitalized for \$5000, are Elias Gunnell, Lynford E. Geer and Charles C. West.

The Syohers Machinery Company, Spokane, Wash., will rebuild its plant, recently destroyed by fire, but will not be in the market for machinery of any kind. The company manufactures wood pulleys, machines and supplies for use in flouring mills and grain elevators.

The Indianapolis Drop Forging Company, Indianapolis, Ind., is about to let contracts for new buildings to replace those recently destroyed by fire, as follows: Hammers shop, 55 x 135 feet, iron roof and sides; machine shop, 50 x 250 feet, one story, brick; boiler house, 35 x 50 feet, brick; warehouse and office, 50 x 60 feet, brick. Machinery and power equipment were so little damaged that it was found necessary to buy but few machines, and these will be purchased from time to time as required.

The Peoria Steel & Tool Company, Peoria, Ill., recently organized, has elected the following officers: President and general manager, Frank H. Farnham; vice-president, E. R. Carter; treasurer, Ralph N. Bailey; secretary, F. A. Rogers; Executive Committee: Edward Leisy, P. P. Herschel and Frank H. Farnham. The company will make all kinds of cutlery and a large line of automatic tools, and in addition will have a steel department, where tool, die and spring steels will be made.

J. P. Hettinger, 160 Washington street, Chicago, will erect a factory for the manufacture of machinists' specialties. The building will be 40 x 100 feet, with engine room in rear. A gasoline engine, shafting, &c., will be required.

The Rapid-Fire Gun Works of the Driggs-Seabury Ordnance Corporation, now building at Sharon, Pa., will be enlarged a second time before the foundations have been finished. The main building is to be 440 feet in length instead of 300 feet, as originally intended. Four other buildings are to be erected.

The Defiance Machine Works, Defiance, Ohio, has recently made some important additions to its machine tool equipment. This concern has been very busy for some time, and additions to equipment were made to meet growing demands of its business.

The Big Four Railroad Company is reported to be planning to purchase additional machinery for its shops at Bellefontaine, Delaware, Ohio, and Brightwood, Ill. The company is in the peculiar position of having all its equipment in constant use, due to the heavy St. Louis traffic and the increasing freight business. It is expected that the traffic this winter will be very heavy and there will be a short time between the close of the exposition on December 1 and the winter weather, which usually sets in coincident with a heavy run on equipment. This will necessitate taking care of a large amount of repair work in a very short time.

The Buckeye Machine Company, Columbus, Ohio, has been incorporated with \$30,000 capital stock, by J. A. Taft, G. W. Shurtle, F. A. Andrews, C. O. Sherwood and Cyrus Hewling. The company will make and repair machinery.

The Commercial Club of Springfield, Ohio, has succeeded in raising \$12,000 with which to purchase a site for the proposed new shops of the Detroit Southern Railroad. The company has been planning to erect large machine and repair shops and has been considering propositions from several other towns along the line. It is considered very probable that Springfield will secure the shops.

The Acme Machinery Company, Cleveland, manufacturer of bolt and nut machinery, reports that it has experienced a pronounced improvement in the demand for its machinery during the past 60 days. There has been a very marked improvement in the demand from abroad, and the company has recently shipped tools of the character mentioned to South Africa, South America and Australia. The demand from all European countries shows a marked improvement.

It is stated that the Lake Erie & Pittsburgh Railroad will not build shops at Lorain, but will erect them a few miles south of Lorain, Ohio, on account of the very high prices placed on the town frontage wanted by the company.

J. H. Lingle, Bellefonte, Pa., manufacturer of power hammers, reports a better demand, orders being in hand for hammers for the Pennsylvania Railroad, Central Railroad of New Jersey, Howells Mining Drill Company, Plymouth, Pa., and a number of other concerns. Indications for future business are somewhat more favorable and some good business is anticipated in the near future.

The contract for the building of new shops for the Wheeling & Lake Erie Railroad Company, at Canton, Ohio, has been let to George H. Wilke. The buildings will cost \$40,000 and will be as follows: Locomotive repair shop, 110 x 190 feet, walls 19 feet high (this includes a tin shop, 30 x 33 feet, and a black-

smith's shop, 30 x 77 feet, all under the same roof); car repair shop, 78 x 239 feet, walls 19 feet high, and a power house, 45 x 70 feet, walls 18 feet high. The matter of individual tools and machines to be installed has not as yet been determined upon. J. E. Taussig, Canton, Ohio, is superintendent of the road.

#### Power Plant Equipment.

The Gem City Boiler Company, Dayton, Ohio, which is erecting a new plant, has purchased cranes from the Niles-Bement-Pond Company. The contract for the new air receiver which is required has not been placed.

The Toledo & Indiana Railway Company, Toledo, Ohio, is having plans prepared for the erection of a large central power station at Stryker, which will supersede the present power station at Delta. F. B. Perkins of Toledo is consulting engineer and H. C. Warren, Delta, is purchasing agent.

The General Engine Company has been incorporated at Buffalo with a capital stock of \$100,000, to manufacture rotary engines of the Hoffman patent. The directors are Win. M. Hoffman, R. W. Day, Blinn Yates and B. F. Hoffman of Buffalo, and Hamilton Carhart of the Carhart Mfg. Company, Detroit, Mich.

The Toronto-Niagara Power Company, which is constructing a huge power plant on the Canadian side at Niagara Falls, from which electric power will be transmitted to Toronto, has awarded the contract for four water turbines of 10,000 horse-power capacity each to the I. P. Morris Company, Philadelphia. These turbines will be direct connected to 7500-kw. generators, which are to be built and installed by the Canadian General Electric Company.

The Brown Corliss Engine Company, Corliss, Wis., has just secured an order for one 24 x 44 x 48 inch tandem compound rolling mill engine for the United States Steel Corporation, to be installed at the McKeesport (Pa.) plant.

In connection with its gas producing apparatus R. D. Wood & Co., Philadelphia, Pa., report the following recent orders: Three hundred and fifty horse-power, Allis-Chalmers Company, Milwaukee, Wis.; National Iron & Steel Company, Mexico, D. F.; Royle & Aken, Newark, N. J.; New York Transportation Company, New York (two plants); A. F. Burnot Bro., Philadelphia; Allegheny Milling Company, Covington, Va.; Rushmore Dynamo Works, Plainfield, N. J.; J. B. Rice, Jr., & Co., Bordentown, N. J.; Bethlehem Steel Company, South Bethlehem, Pa.; Ball Bros. Glass Mfg. Company, Muncie, Ind.; City of St. Joseph, Mich.; Backus Water Motor Company, Newark, N. J.; Marling, Hart & Co., Dunkirk, Ind.; Libby Glass Company, Toledo, Ohio; Diamond Window Glass Company, Gas City, Ind.; New Jersey Frele Zeitung, Newark, N. J.; Florence Improvement Company, Florence, S. C., two plants; Hunterdon Electric Company, Lambertville, N. J.; 600 horse-power plant, Allis-Chalmers Company, for export; the plants at Louisiana Purchase Exposition; United States Geological testing plant in "The Gulch," at St. Louis, and 2000 horse-power "Mond" by-product plant for the Pennsylvania Salt Company.

The Board of Public Service of Elyria, Ohio, has asked for an appropriation of \$50,000 for the purpose of duplicating the present equipment of the water works pumping station. At present the city has but one large pump.

The Northern Electrical Mfg. Company, Madison, Wis., has been awarded the contract for the entire motor equipment of the new shops of the Southern Railway Company at Spencer, N. C., designed by S. D. Cushing, signal and electrical engineer. About 450 horse-power of motors will be required. A combination of group and individual drive will be used, and all motor driven tools requiring speed variation are to be equipped with Northern two-wire, variable speed motors. The Northern Electrical Mfg. Company will also furnish a 50-kw. generator for lighting the shops of the company at Alexandria, Va.

The J. B. Williams Company, Glastonbury, Conn., is building a new power plant, 42 x 109 feet, with a 125-foot chimney. Three Bigelow horizontal tubular boilers, 78 inches by 20 feet, will constitute the new battery. Two engines are to be installed—a Rice & Sargent 14 x 30 inch, direct connected to a 150-kw. Crocker-Wheeler generator, and a 12 x 30 inch Greene engine belted to a 65-kw. engine type generator.

Heating and power plant equipment is required by the Matawan Steel & Iron Company, Matawan, N. J., for the new buildings now in course of erection. Most of the machinery equipment will be built by the company itself. At present the foundry and power house are being constructed, which will be followed later by other buildings.

The Vermont Marble Company, Burlington, Vt., is to establish a new electric plant operated by three turbine water wheels of the vertical type. The electrical apparatus will consist of three 750-kw., 60-cycle alternating current generators, and a large number of induction motors.

James E. McNary, Empire Building, Pittsburgh, manager of the Pittsburgh office of the Hooven-Owens-Rentschler Company, Hamilton, Ohio, builder of Hamilton Corliss engines, reports the following sales of these engines: One 1300 horse-power cross compound, direct connected to an 800-kw. generator,

Seamless Tube Company, Monessen, Pa.; one 1400 horse-power, Ohio Valley Steel & Foundry Company, Paden City, W. Va.; one 250 horse-power, Citizens' Light, Heat & Power Company, Portage, Pa.; one 500 horse-power, Bellaire Electric Light Company, Bellaire, Ohio, and one 400 horse-power, Hall Steam Pump Company, Allegheny, Pa.

Citizens of Crestline, Ohio, have voted unanimously in favor of issuing bonds to the amount of \$75,000 for the purpose of constructing a new water works system. Owing to this announcement the Pennsylvania Railroad Company will start at once on extensive improvements to its machine shop and yards at Crestline.

The Board of Public Service of Columbus, Ohio, has been authorized to spend \$5500 for the purchase of four large water meters in order to ascertain the daily water consumption of the city. The city is planning to purchase a new pumping engine, which will cost about \$100,000.

The Toledo Home Heating & Lighting Company, Toledo, Ohio, is planning to erect a power plant with a view to furnishing electric light and steam heat in the city. The city lighting contract expires January 1, and the new company will make a bid for this work.

W. I. Gray & Co., Minneapolis, Minn., were the successful bidders for the Chetek, Wis., water works system, bids for which closed September 9. The contract calls for the erection of a 50,000-gallon steel tank and tower and furnishing 1100 feet of 8-inch pipe and a 5 horse-power gasoline engine and pump.

#### Foundries.

The Great Falls Iron Works, Great Falls, Mont., states that it has the contract for furnishing the new water mains for Lethbridge, Mont. The tonnage of pipe is not given, but it is understood to be large.

The Summit Foundry Company, Geneva, N. Y., has temporarily leased the plant of the Fountain City Drill Company at La Crosse, Wis. The lessor will later take permanent possession and run a branch office and factory at La Crosse.

P. A. Hughes and Guy S. Rinebolt of Johnstown, Pa., and W. K. Gore and Philip Augsten of Chicago, Ill., have purchased from the receiver the Matthews Steel Casting Company, at Matthews, Ind., and have organized a stock company to operate it, capitalized at \$50,000. They are erecting a building 40 x 285 feet as an addition to the plant.

Within five weeks the Pennsylvania Railroad Company expects to be operating its immense wheel foundry at Altoona, Pa. Ground is also being cleared for a soft iron foundry, a brass foundry and pattern shops.

The foundry connected with the Danville (Pa.) Stove Works broke its record last week by casting 22 tons of metal in one day and 21 tons the day following. The works are operating on very large orders.

The old iron foundry of the Wabash Valley Foundry Company, Vincennes, Ind., of which Franklin Clarke and H. A. Buck were founders and principal owners, has been sold by a commissioner at public auction to A. Brandon Clarke, son of the deceased Franklin Clarke, for \$7350. The foundry was established in 1865 and includes a tract of land 249 x 300 feet, with three brick buildings—office, machine shop and foundry.

The new plant of the Birmingham Steel & Iron Company, Birmingham, Ala., has been placed in operation. The product is steel castings.

The Lumen Bearing Company, Buffalo, N. Y., will erect a new foundry building, 60 x 101 feet, which will be equipped with the Coburn trolley system for carriers. No new machinery will be required.

#### Bridges and Buildings.

The business of James T. Croft & Co., Boston, Mass., manufacturers of structural iron and steel, has been incorporated as the Croft Iron Works, with a capital stock of \$50,000. Frederick N. Rock is president and treasurer; A. P. Crocker, vice-president, and H. O. Lane, clerk, the three constituting the Board of Directors. The company is to enlarge its works at Roxbury by the addition of a one-story building 45 x 97 feet, which will double the capacity. The present power plant will be ample for the increased plant.

The Board of Public Service of Cleveland has placed a contract with Williams Brothers & Morse of Ashtabula, Ohio, for the erection of a viaduct over the Nickel Plate Railroad tracks at Detroit street. The bridge will cost \$26,950.

The Wheeling & Lake Erie Railroad will erect a steel bridge over the Cuyahoga River at Cleveland. The abutments of the present structure interfere with navigation. The location of this bridge is a peculiar one, as at this point there are three bridges, one above another.

The city of Akron, Ohio, the Pennsylvania and Baltimore & Ohio railroads and the Northern Ohio Traction & Light Company will build a viaduct to cost about \$144,000 on Mill street, that city. The interested parties have agreed upon the division of cost and the Board of Public Service will ask for proposals at once.

The Newcastle Bridge Company, Indianapolis, Ind., has secured the contract for the steel-concrete bridge to be built over

the White River at Michigan street, Indianapolis. The bridge will be 340 feet long. The contract price was \$125,000.

The Hanika Iron Works, Celina, Ohio, has passed into the hands of Dr. G. J. C. Wintermute as receiver.

Scribner & Heyworth, Railway Exchange Building, Chicago, secured contract for erecting a steel bridge across the St. Joseph River at Jefferson street, South Bend, Ind., the contract price being \$119,000 for the bridge proper and \$6600 for the piling. Work has already begun on the bridge and completion is promised November 1, 1905. The structure calls for 210 tons of structural steel.

Joseph Cody & Sons, Peoria, Ill., were awarded the contract for constructing a steel bridge across the Illinois River at that city, the contract price being \$290,000 and the date of completion on the bridge given as April 1, 1905. The bridge will require 2500 tons of steel.

#### Fires.

Harry J. Andrew's feidspar mill, Glastonbury, Conn., was totally destroyed by fire September 11, with a loss of \$15,000.

The plant of Relerson Machine Company, Portland, Ore., was recently damaged \$30,000 by fire.

The Central Iron Works, Syracuse, N. Y., was partly destroyed by fire September 15. The loss is about \$50,000.

The large plate glass factory of Zapen & Border, Carlton, near Passaic, N. J., was destroyed by fire September 15. The loss is estimated at \$100,000.

The Cyclops Steel Works, Titusville, Pa., was almost totally destroyed by fire last week.

The plant of the St. Paul Sash & Door Company, St. Paul, Minn., was destroyed by fire September 16. The loss is placed at \$75,000.

The plant of the Buckeye Foundry Company, St. Paul, Minn., was recently damaged \$3000 by fire.

The foundry of Eastwood & Mankin, Sherwood, Texas, was recently destroyed by fire. The loss is about \$12,000.

#### Hardware.

P. & F. Corbin, New Britain, Conn., have purchased the extensive property of the New Britain Knitting Company, including large buildings and an extensive tract of land in the immediate vicinity of the Corbin works. The company states that its new property will be used for the extension of the business of the American Hardware Corporation, but it is impossible at the present time to tell for just what purposes or what branch of the business the buildings will be used.

H. C. Hart has disposed of his interest in the Union Cutlery & Hardware Company, Unionville, Conn., to Ramage & Tabor, the present managers, who report that the output has recently been increased over 100 per cent.

The new buildings of W. B. Bertel's Son & Co., Wilkes-Barre, Pa., to take the place of the old factory, which was destroyed by fire last October, are now complete. The new plant cost about \$100,000. The property consists of three brick buildings, which are fire proof, one being 75 x 180 feet, another 150 x 175 feet and the third 25 x 143 feet. It is expected that when the plant is in full running order 25,000 lard pails, 2500 dinner pails and 1000 wash boilers will be manufactured every day, lard cans being their specialty. The plant is run by steam power, and they have their own electric plant for lighting purposes.

The Parks Mfg. Company, Limited, is the name of a new corporation at Lowell, Mich. This company, which is incorporated for \$10,000, fully paid in, will manufacture sprayers, cream separators, trucks and bag holders and a line of hardware novelties. The incorporators and owners of the business are: C. W. Parks, president; F. W. Hinyan, vice-president; D. R. Whitney, secretary; D. H. Owen, treasurer; R. B. Loveland.

The Border Bolt & Nutlock Company, organized at Richmond, Ind., April 27, has almost completed its buildings and will soon be ready to turn out 50,000 bolts and nuts a day. The main factory is a steel structure, 40 x 100 feet, equipped with modern machines and methods for the manufacture of nuts and bolts. This machinery has been made special from designs and patterns furnished by the company. One of the leading products of the company will be a patented nut lock, invented by Charles C. Border, who is superintendent of the plant. This nut lock is intended particularly for railroads and, we are advised, has been used experimentally by the Pennsylvania, Rock Island and the Erie roads, as well as by shipbuilders. The following officers also constitute the Board of Directors of the company: John M. Lontz, president; Wm. H. Alford, vice-president; Wm. L. Thornburg, treasurer; Wilfred Jessup, secretary; Chas. C. Border, superintendent.

The Andrews Wire & Iron Works, Rockford, Ill., has let to the Commercial Company of Indianapolis the contract for supplying generator and motors for its new wire plant. The Barth Company of Milwaukee has the contract for the elevator.

At a meeting of the Board of Trustees of the Frazer & Jones Company, Syracuse, N. Y., held September 16, Charles R. Jones was elected treasurer in the place of George S. Hler, who recently resigned, and O. P. Letchworth of Buffalo was



chosen secretary, the office vacated by Mr. Jones. R. W. Jones is president of the company and Frederick Frazer, vice-president. The company is very busy at present, employing 450 men and operating its plant to the fullest capacity. Its specialty is harness hardware. Mr. Letchworth, the new secretary of the company, is president of the Pratt & Letchworth Company, Buffalo, manufacturer of steel and iron castings and malleable iron, and president of the United States Hame Company of the same city, in which company the stockholders of the Frazer & Jones Company are largely interested.

Stuber & Kuck, manufacturers of plated tinware, Peoria, Ill., have found their present quarters too small and are looking for a new location offering them more opportunities for growth of their business. Whether they will leave Peoria or not will depend upon the propositions made by outside cities.

The Keopke Nut & Bolt Company, Elyria, Ohio, has commenced work on an addition 50 x 73 feet.

The Cleveland Hardware Company of Cleveland is erecting a new boiler house in which will be installed 1600 horse-power of Babcock & Wilcox boilers, with all modern accessories.

Geo. F. Whiting, Skowhegan, Maine, has embarked in the manufacture of a general line of edge tools, a specialty being made of lumbermen's wedge axes. Mr. Whiting was formerly superintendent of the plant of the American Axe & Tool Company at East Douglass, Mass.

The plant, equipment and stock of the Young Repeating Arms Company, Columbus, Ohio, have been purchased by the Sears-Roebuck Company, Boston. The factory in Columbus will be dismantled and the machinery will be removed to Boston. The business of the company has been in litigation for some time, and the sale was made at auction.

#### Miscellaneous.

The Hunt Metal Corner Company, Westboro, Mass., has been incorporated to manufacture a new metal corner designed to take the place of the usual wooden corner used in modern building construction. The officers of the company are: President, Jonathan A. Hunt, Westboro; vice-president, Lewis T. Houghton, Worcester; treasurer, Arthur V. Harrington, South Framingham; clerk, Arthur R. Higgins, Westboro.

The Pouliot Boat & Power Company, Sandusky, Ohio, has been chartered by Charles F. Mischler, Joseph T. Sloat, Joseph A. Pouliot, Eugene Astel and Jacob Schrank. The company will establish a dry dock and shop for the purpose of building power and sail boats, making a specialty of gasoline launches.

The Cleveland and Youngstown owners of the Struthers Cement Company, whose large cement plant at Struthers, Ohio, was recently destroyed by fire, met last week and decided to let contracts for a new plant as soon as the insurance was adjusted. The new building will be of concrete fire proof construction.

The American Steel Package Company, Defiance, Ohio, will erect a new building, 36 x 200 feet, which is to be completed within 60 days.

The American Car & Foundry Company, St. Louis, Mo., has commenced operations in the recently acquired Binghamton Car Works, Memphis, Tenn. The company does not contemplate making any extensive repairs to the plant.

The Cataract Machine & Automobile Company has been incorporated at Niagara Falls, N. Y., capital \$5000, to manufacture automobiles, &c. The incorporators are Fred. V. Simpson, Max Amberg and Augustus Porter.

The Buffalo, Rochester & Pittsburgh Railroad Company is opening two of the largest limestone quarries in Pennsylvania, near New Castle, Pa., on a 7-mile branch which it is building for the purpose of reaching the limestone deposits. A very large cement plant is to be erected at the terminus of this branch. Capitalists interested in the railroad company are also heavily interested in the cement plant, and the Marquis Limestone Quarries will be connected with the new branch.

The Harblson-Walker Refractories Company, Pittsburgh, Pa., advises us that the recent fire at Hays works will not in any way affect deliveries on orders. No. 1 and No. 2 works were unaffected by the fire, and it will be possible to make shipments without interruption from these works. Arrangements have been made so that the friends of the refractories company will suffer no inconvenience from this accident.

The American Shipbuilding Company of Cleveland has closed a contract for another steel vessel, making the third order for next spring delivery. The vessel is for Wm. K. Becker. The company will build the hull only and the vessel will be provided with engines and boilers from another vessel. The American Shipbuilding Company has placed a contract with Jones & Laughlin for about 2500 tons of shapes and plates for use in this vessel.

Work on an addition 188 x 210 feet to the plant of the American Car & Foundry Company's plant at Berwick, Pa., was started last week. The addition will be used exclusively for the construction of steel passenger coaches.

The Abbott Carriage Goods Company, Toledo, Ohio, has been formed with \$100,000 capital stock, succeeding a company of similar name chartered under South Dakota laws. The company will locate a factory in Toledo for the manufacture of several lines of metal carriage specialties and other novelties. R.

E. Abbott, Dr. Oscar Hasencamp and E. B. Bingham are at the head of the company.

The Jacob Y. Shantz & Son Company has been incorporated at Buffalo with a capital stock of \$160,000 to manufacture tailors' hardware and other specialties. The directors are Dillman B. Shantz, Charles F. Kilboffer and Samuel F. Moran.

The Century Telephone Company has been incorporated at Buffalo with a capital stock of \$500,000 to manufacture and furnish telephone equipment to independent telephone companies, and a factory will be established in Buffalo for this purpose. The new company is a subsidiary company of the Consolidated Telephone Company, which controls the long distance business of the independent companies in Western New York and Northern Pennsylvania. The incorporators and directors are G. B. Hubbell, Martin Carey, Theodore S. Fassett and A. D. Bissell, all of Buffalo.

The Carolina Cotton Mills, Graham, N. C., which is to install a new power plant, has purchased an Allis-Chalmers engine, and boilers from the Casey & Hedges Company, Chattanooga, Tenn.

The Smet-Solvay Company is laying the foundations for the large by-product coke plant to be built on the Calumet River near South Chicago, reference to which has been made previously in our columns. An office and small machine shop are already installed, but the complete plant will not be ready for operation until next summer. Purchases are being made for this plant from the Syracuse, N. Y., offices of the company.

The Berthelet Construction Company has been organized at Milwaukee, Wis., for the manufacture and sale of artificial stone building blocks and ornamental work. The plant of the company adjoins that of the Milwaukee Cement Company, whose product will be largely used in the manufacture of cement blocks.

The United Lead Company, New York, has purchased the plant of Tatham & Bro., Philadelphia, which it has been operating for some time under an agreement.

The Westinghouse Traction Brake Company, Pittsburgh, has received an order from the Los Angeles Railway Company of California for the equipment of 32 cars with motor-driven brakes. This completes an original order for 152 cars, the entire rolling stock of the California company being equipped with this new form of brake.

Archibald Taylor and Walter Ancker have been appointed receivers for the Baltimore Shipbuilding & Dry Dock Company, Baltimore, Md. The liabilities are \$97,000 and the assets \$735,000. The receivers will continue the business, which is placed in their hands to avoid the assets becoming dissipated by suits and other legal proceedings against the company.

Howard & Morse, 45 Fulton street, New York, manufacturers of the Blackman rotary ventilator, driven by electric motor, steam or gas engines, have just installed a comprehensive system of Blackman ventilators aggregating \$20,000 for ventilators and operating mechanism only, in the new St. Regis Hotel, Fifth avenue and Fifty-fifth street. They also installed recently a similar outfit for the new Hotel Astor, Seventh avenue and Forty-fourth street. Other recent installations of the same system include the Belmont Hotel and Hall of Records. They have equipped many of the largest buildings in New York with the Blackman ventilators, among them being the Metropolitan Museum of Art, Museum of Natural History, Stock Exchange, Waldorf-Astoria, Columbia College, Chamber of Commerce, Custom House and Post Office.

At Pittsburgh last week 11 additional material contracts were placed in connection with the extension to the Carnegie Institute. Six of these were for the main library building and five for portions of the power house, the total amount of the 11 contracts being over \$275,000. The awards were made by William Miller & Sons Company, the general contractors, and were as follows: For composition roofing, P. Le Goullon, Pittsburgh; for hardware, J. Woodwell & Co., Pittsburgh; for fire proofing, National Fire Proofing Company, Pittsburgh; ornamental iron work, W. S. Tyler & Co., Cleveland; painting and glazing, E. R. Cluley, Pittsburgh; tile roofing, Scott A. White, Pittsburgh. For the power house in Junction Hollow: Construction of the mammoth brick chimney, Tatnall Engineering Company, Philadelphia; fire proofing, National Fire Proofing Company, Pittsburgh; painting and glazing, E. R. Cluley, Pittsburgh; hardware, Woodwell & Co., Pittsburgh, and ornamental iron work, Tyler & Co., Cleveland.

The Toledo Metal Wheel Company, Toledo, manufacturer of bicycles and steel wheels, will erect an addition, 50 x 60 feet, four stories high, to be constructed of brick and steel. Bernard Becker of Toledo is preparing plans for the building.

The plant of the Bucyrus Foundry Company, at Bucyrus, Ohio, has been leased to S. F. Bonebrake, who will install machinery for the production of cement building blocks. Machinery for the production of cement roofing material will also be installed.

The Detroit Steel Products Company is the name of a new firm incorporated at Detroit, Mich., by John G. Rumney, John H. Avery, Walter S. Russel, Henry Russel and N. D. Carpenter. The capitalization of the firm is \$50,000, of which \$10,500 is paid in. The company will make a specialty of manufacturing automobile springs.

## The Iron and Metal Trades

The action of the Billet Association has attracted a good deal of attention, but is really not very important, since the tonnage of Steel Billets sold in the open market is insignificant when compared with the days before the consolidations. Then, too, the great bulk of what crude Steel is sold is delivered on old sliding scales based on the price of Bessemer Pig Iron. Therefore, the open reductions in prices of Billets and Sheet Bars do not materially change the situation. It does not justify the expectations, evidently indulged in by some consumers, that prices in certain finished lines must be correspondingly reduced.

The lower Steel prices give a possible chance to compete to a few small rolling mills whose business has not been important enough to secure to them sliding scale contracts. It makes it somewhat harder, too, for the Iron puddling mills, who cannot correspondingly cut down their selling prices for Muck Bars.

The reduction in the price of Steel Bars and of Merchant Steel is not regarded as of much importance.

Business in Structural Material does not appear to have been stimulated to any extent by the recent lowering in association prices on Shapes. In fact some sellers note that the market is rather quieter. It is intimated, however, that quite a number of large long time contracts with architectural concerns were closed before the official announcement was made.

The material for the third lake vessel lately ordered has now been placed, the aggregate tonnage being about 7000 tons.

In the Plate and Shape trades the principal effect of the concessions has been to bring out specifications on old contracts, but for new business consumers seem to cling to the conviction that the end of readjustments of prices has not yet come.

The trade in Merchant Pipe is quieter and there are again reports of slight shading. There is not much that is encouraging from the Sheet and Tin Plate trades.

Some round lots of Foundry Iron have been placed in different parts of the country, but reports reflect a somewhat uneven market. The bulk of the business is being done by the Northern furnaces, some of whom are going pretty far afield. Thus, Buffalo furnace interests have been playing quite an important role lately in New England, entering the tidewater markets via the Erie Canal and driving into the interior through direct rail connections.

A very considerable number of Northern makers decline to sell at present prices for delivery after January 1, 1905, and in some instances are holding out for an advance.

The smaller Southern producers are pushing sales somewhat, while the large companies are holding at \$9.50 for No. 2 at furnace, Birmingham. In certain markets Sheffield can deliver more cheaply, which is often misconstrued as proof of \$9.25 sales, Birmingham. The Iron from this district is rather higher in phosphorus.

The leading Birmingham producers are continuing their fight for ridding themselves of the miners' union and seem to be gaining headway.

## A Comparison of Prices.

Advances Over the Previous Month in Heavy Type.  
Declines in Italics.

At date, one week, one month and one year previous.

	Sept. 21, 1904.	Sept. 14, 1904.	Aug. 24, 1904.	Sept. 23, 1903.
<b>FIG IRON:</b>				
Foundry Pig No. 2, Standard, Philadelphia .....	\$14.25	\$14.25	\$14.25	\$15.75
Foundry Pig No. 2, Southern, Cincinnati .....	12.00	12.00	12.00	14.75
Foundry Pig No. 2, Local, Chicago .....	13.50	.....	13.25	15.75
Bessemer Pig, Pittsburgh .....	12.60	12.60	12.70	16.85
Gray Forge, Pittsburgh .....	11.75	11.75	11.85	14.50
Lake Superior Charcoal, Chicago .....	14.75	.....	15.00	19.00

### BILLETS, RAILS, &c.:

Steel Billets, Pittsburgh .....	19.50	20.00	21.00	27.00
Steel Billets, Philadelphia .....	21.50	22.50	24.00	27.50
Steel Billets, Chicago .....	22.50*	22.00	22.00	28.00
Wire Rods, Pittsburgh .....	26.00	26.00	28.00	34.50
Steel Rails, Heavy, Eastern Mill .....	28.00	28.00	28.00	28.00

### OLD MATERIAL:

O. Steel Rails, Chicago .....	11.00	.....	11.00	14.50
O. Steel Rails, Philadelphia .....	11.75	.....	11.75	15.50
O. Iron Rails, Chicago .....	16.00	.....	15.75	17.00
O. Iron Rails, Philadelphia .....	15.50	15.50	15.00	18.00
O. Car Wheels, Chicago .....	11.50	.....	11.00	18.00
O. Car Wheels, Philadelphia .....	11.50	11.50	12.00	17.00
Heavy Steel Scrap, Pittsburgh .....	11.50	.....	11.50	16.00
Heavy Steel Scrap, Chicago .....	10.00	.....	9.50	13.00

### FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia .....	1.43½	1.43½	1.48½	1.60
Common Iron Bars, Chicago .....	1.35	1.35	1.35	1.50
Common Iron Bars, Pittsburgh .....	1.25	1.25	1.30	1.55
Steel Bars, Tidewater .....	1.44½	1.44½	1.49½	1.73½
Steel Bars, Pittsburgh .....	1.30	1.30	1.35	1.60
Tank Plates, Tidewater .....	1.54½	1.54½	1.74½	1.78
Tank Plates, Pittsburgh .....	1.40	1.40	1.60	1.60
Beams, Tidewater .....	1.54½	1.54½	1.74½	1.73½
Beams, Pittsburgh .....	1.40	1.40	1.60	1.60
Angles, Tidewater .....	1.54½	1.54½	1.74½	1.73½
Angles, Pittsburgh .....	1.40	1.40	1.60	1.60
Skelp, Grooved Steel, Pittsburgh .....	1.30	1.30	1.32½	1.60
Skelp, Sheared Steel, Pittsburgh .....	1.35	1.35	1.35	1.70
Sheets, No. 27, Pittsburgh .....	2.00	2.00	2.00	2.55
Barb Wire, f.o.b. Pittsburgh .....	2.05	2.05	2.05	2.60
Wire Nails, f.o.b. Pittsburgh .....	1.60	1.60	1.60	2.00
Cut Nails, f.o.b. Pittsburgh .....	1.60	1.60	1.65	2.15

### METALS:

Copper, New York .....	12.75	12.62½	12.50	13.50
Spelter, St. Louis .....	4.95	4.95	4.72½	5.75
Lead, New York .....	4.20	4.20	4.10	4.40
Lead, St. Louis .....	4.10	4.12½	4.00	4.40
Tin, New York .....	27.02½	26.42½	26.85	26.75
Antimony, Hallett, New York .....	7.00	7.00	7.00	6.25
Nickel, New York .....	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York .....	3.49	3.49	3.49	3.99

\* Nominal.

## Chicago.

FISHER BUILDING, September 21, 1904.—(By Telegraph.)

The loss of the manuscript of last week's Chicago market report by the Postal Telegraph Company and its failure to find it until late Wednesday resulted in the necessity of printing a major portion of last week's issue without the Chicago report. When finally the message was received the forms were made over and a late edition was printed containing the Chicago market report. This seems to be a week in which the forces are being marshaled for a vigorous selling campaign. It is very sure that the strongholds of the buyers will be vigorously besieged, and there is some indication that their bulwarks of indifference may be battered down. In other words, this is a preparatory week, in which actual trading is slow, but which holds out signs promising a resumption of business very soon. The most important event, of course, is the reduction in the price of Billets to the basis of \$19.50, Pittsburgh, and the adoption of a new basis by which Chicago and other points outside of Pittsburgh will pay the full freight to destination on Billets the same as they do on Finished Material, instead of the old arbitrary differential. In this case Chicago pays \$3 freight, instead of having only \$1 differential in Chicago price, making the Chicago basis \$22.50. Steel Bars have been reduced officially to the basis of 1.30c., Pittsburgh, or 1.46½c., Chicago, in car lots. An unusually large inquiry for Pig Iron has been received here within the last three or four days, including lots of 5000 and 10,000 tons, and even larger. The inquiry comes not only from the large producers, but from the vast army of jobbing foundries. Prices on Northern Iron have been advanced by one producer 25c. a ton for this year's delivery, and the general disposition is to charge 50c. premium for the first half of



1905 over present prices. Some soft spots have developed in Southern Irons, but not of sufficient importance yet to warrant us in reducing their prices. A small inquiry is received for Standard Section Rails from electric roads, but the Rail business in general is very quiet. The failure of buyers to express any interest in the \$4 reduction on Structural Material is a distinct disappointment to the trade, but it is certain that if producers show a disposition to hold to the new prices without wavering buyers will come in line just as soon as they are convinced they have nothing to gain by further waiting. A stockyards firm bought a 1200-ton Steel building, which is the only one of importance closed during the week. The Plate business also is very quiet, but not quite as lethargic as Structural Steel. Prices on Heavy Sheets, following the cut on Plates, have been more or less demoralized, independent mills quoting \$2 and \$3 a ton below former prices on gauges 16 and heavier. There is no change and only a moderate business in Boiler Tubes and Pipe. Cast Iron Pipe makers are doing a comfortable routine business, characterized by no orders of magnitude. The city of Chicago bought its 1400 tons of 24-inch Pipe from a Southern independent, much to the surprise of the leading producer. The latter, however, took from an independent mill in Portland, Ore., 750 tons for that city. Last week's tonnages in this column for Chicago and Rockport, Ohio, were made to read thousands instead of hundreds by a telegraphic error. Old Materials have rallied somewhat from last week's break, but are in a chaotic condition. Several large lists that will be closed September 22 will tend to crystallize the market. Tin has advanced 1c. per lb. Coke is weak and inactive.

**Pig Iron.**—A feeling amounting to conviction exists in the minds of producers of Pig Iron that prices for 1905 will be very much higher than they are now. This feeling has crystallized itself into a refusal on the part of producers of Northern Iron to book business for 1905 for less than 50c. advance for the first half and \$1 advance for the second half over present prices, making the minimum basis for the first half of 1905 \$14, as against \$13.50, the minimum price for delivery the balance of this year. One Northern producer has gone further than this, and announces a minimum price of \$13.75 for 1904 delivery, and \$14.25 for the first half of 1905. Unfortunately, the same strength is not manifested among Southern Iron producers, and some business is being taken at the present prices running well into next year. In addition to this there are some Southern producers who are shading the \$9.50, Birmingham, price on first-class Iron 10c. to 15c. a ton, with a High Phosphorus Iron from some districts selling at the equivalent of \$9.25, Birmingham, for No. 2. Inquiry for prices on Pig Iron is large in volume and more diversified in character than has been witnessed for several months. There are several lots being figured on, ranging from 5000 to 15,000 tons, for delivery up to the middle of 1905. This improvement in demand is widespread, and an encouraging sign is that it includes the jobbing-foundry trade. Several lots of 500 to 2000 tons have been closed during the last week, some of which was Northern and some Southern Iron. We quote:

Lake Superior Charcoal.....	\$14.75 to \$15.00
Northern Coke Foundry, No. 1.....	14.00 to 14.50
Northern Coke Foundry, No. 2.....	13.50 to 14.00
Northern Coke Foundry, No. 3.....	13.00 to 13.50
Northern Scotch, No. 1.....	14.00 to 14.50
Ohio Strong Softeners, No. 1.....	14.80 to 15.05
Ohio Strong Softeners, No. 2.....	14.55 to 14.80
Southern Silvery, according to Silicon.....	14.15 to 15.15
Southern Coke, No. 1.....	13.65 to 13.90
Southern Coke, No. 2.....	13.15 to 13.40
Southern Coke, No. 3.....	12.90 to 13.15
Southern Coke, No. 4.....	12.15 to 12.40
Southern Coke, No. 1 Soft.....	13.65 to 13.90
Southern Coke, No. 2 Soft.....	13.15 to 13.40
Southern Gray Forge.....	12.15 to 12.40
Southern Mottled and White.....	11.90 to 12.15
Malleable Bessemer.....	13.50 to 14.00
Standard Bessemer.....	14.25 to 14.75
Jackson County and Kentucky Silvery.....	
6 to 10 per cent. Silicon.....	17.30 to 19.30
Alabama Basic.....	14.10 to 14.35
Virginia Basic.....	14.10 to 14.35

**Billets.**—The trade here has just been apprised of the new price on Billets, which is \$19.50, Pittsburgh, for 4 x 4 and larger, with \$2 a gross ton extra for smaller sizes, and the same differential for Sheet and Tin Plate Bars. A radical change has been made also in the method of figuring prices at points outside of Pittsburgh. The Chicago price, for instance, instead of being placed arbitrarily at only \$1 a tone above the Pittsburgh price, is \$3 a ton extra, or \$22.50 a gross ton for base sizes. In other words, Billets hereafter are to be sold on the Pittsburgh base price plus full freight to destination. As far as can be learned, the prices named above are for either Forging or Rolling Billets, either Open Hearth or Bessemer Steel.

**Rails and Track Supplies.**—The Rail business is quiet, and will be so until after the October meeting of the Rail pool. There are, however, a number of buyers who are placing orders with the Rail producers for future delivery, the price to be subject to any official reduction made by members of the pool. There is some activity shown on the part of new electric interurban propositions and each week

sees some tonnage booked from such interests. The price of Standard Sections is unchanged at the \$28 basis. Light Rails are suffering from the result of keen competition among producers, and while \$20 to \$22 at mill is the nominal price which is quoted for ordinary requirements, better prices will be named when necessary to meet competition on relatively large tonnages. Angle Bars are unchanged at 1.35c. to 1.40c. Spikes are now quoted at 1.60c. to 1.70c. in car lots from mill and as high as 1.85c. in small lots from store. Track Bolts are selling at 2.20c. to 2.25c., base, from mill, with Square Nuts, and 10c. to 15c. extra for Hexagon Nuts, with an advance of about 15c. for shipment from store.

**Structural Material.**—Business in this commodity is a distinct disappointment to the producers and is as quiet this week as it has been any week during the summer. Armour & Co. placed an order for a 1200-ton Steel addition to one of their buildings at the stockyards with the American Bridge Company, but this is the only order of any consequence closed during the week under review. The new prices on Structural Material are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.56½c., Chicago; Angles, 3 to 6 inches, ¼-inch and heavier, 1.56½c.; Angles, larger than 6 inches on one or both legs, 1.66½c.; Beams, larger than 15 inches, 1.66½c.; Zees, 3 inches and over, 1.56½c.; Tees, 3 inches and over, 1.61½c., with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices on Structural Materials are 1.80c. to 1.90c. for Angles, Beams, Channels and Zees, base sizes, with 1.90c. to 2c. for 18, 20 and 24 inch Beams; Tees, 1.85c. to 1.95c. These prices are for either random lengths or cut to lengths.

**Plates.**—Plates do not share in the present depression to the extent that Structural Shapes do, and buyers are covering present needs at least with some indication that future necessities are also being provided for. The large orders placed for Plates by the American Shipbuilding Company for three new Steel vessels previously mentioned in these columns also tend to strengthen the tone of the Plate market. The cut of \$4 a ton announced in our last issue is understood to be sufficient to decrease materially the competition from independent mills, and the cut of \$6 on Plates 6½ to 24 inches is thought by the leading interests to have the desired effect of putting a quietus on the activity of Plate and universal mills which have been quoting extremely low prices on narrow sizes. However, the newly announced prices of Billets and Sheet Bars established practically the former ratio between the finished and unfinished products. The new prices on Plates are as follows: Tank quality, ¼ inch and heavier, wider than 24 and up to 100 inches wide, carloads, Chicago, 1.56½c.; 3-16 inch, 1.66½c.; Nos. 7 and 8 gauge, 1.71½c.; No. 9, 1.81½c.; Flange quality, any width up to 100 inches, 1.66½c.; Sketch Plates, in Tank quality, 1.66½c.; in Flange quality, 1.76½c. In other words, the special price of 1.30c., Pittsburgh, for Narrow Plates does not apply to either Sketch Plates or Flange quality. Following the cut in prices at the mills, a reduction of \$4 to \$5 a ton has been made below former prices for shipment from Chicago warehouses by large jobbers here, making the new prices from store on Plates as follows: Tank Plate, in widths up to 100 inches, ¼-inch and heavier, 1.75c. to 1.85c.; 3-16 inch, 1.85c. to 1.95c.; Nos. 8 and 10, 1.90c. to 2c.; Nos. 12 and 14, 2c. to 2.10c.; No. 16, 2.10c. to 2.20c.; Flange quality, 25c. per 100 lbs. extra.

**Sheets.**—It is evident that there is an increasing tonnage of Sheet Steel being bought, but unfortunately the attitude of producers toward each other is such as to prevent a stiffening of prices commensurate with the increase in demand. On the contrary, Sheets in the heavier gauges have softened considerably, following the cut in Plate prices. From this it is apparent that the demand has not yet caught up with the ability of mills to supply, and mills are still disposed to cut the profits out of business in order to secure tonnage. On gauges 9 to 16 there is apparently no sort of agreement and prices are badly demoralized. We reduce last week's price \$2 a ton on the heavier gauges as representing quotations made by independent mills, and even these figures are shaded another \$1 in some instances on large tonnages. The unusual differential between 16 and 18 gauge of 15c. is due to the fact that there is a disposition on the part of makers of lighter Sheets to hold to some sort of a schedule based on 2.10c., Pittsburgh, for 28 gauge. We quote as follows, f.o.b. Chicago, in carload lots: Nos. 9 and 10, 1.66½c.; Nos. 11 and 12, 1.71½c.; Nos. 13 and 14, 1.76½c.; Nos. 15 and 16, 1.86½c.; Nos. 18 to 20, 2.01½c.; Nos. 22 to 24, 2.06½c.; Nos. 25 and 26, 2.11½c.; Nos. 27, 2.16½c.; No. 28, 2.26½c.; No. 29, 2.36½c.; No. 30, 2.46½c. Store prices are nominally as follows, with slightly lower prices being named on some of the heavier gauges when occasion demands: Nos. 8 and 10, 1.90c. to 2c.; No. 12, 2c. to 2.10c.; No. 14, 2.05c. to 2.15c.; No. 15, 2.15c. to 2.25c.; No. 16, 2.20c. to 2.30c.; No. 18, 2.30c. to 2.40c.; No. 20, 2.30c. to 2.40c.; No. 22, 2.35c. to 2.45c.; No. 24, 2.40c. to 2.50c.; No. 26, 2.50c. to 2.60c.; No. 27, 2.60c. to 2.70c.; No. 28, 2.70c. to 2.80c.; No. 29, 2.85c. to 2.95c. Galvanized Sheets show no change since last week, being offered at from 80

and 7½ to 80 and 10 discount, Pittsburgh, carload lots and larger, and selling from store here at 75, 10 and 5 and 75, 10 and 7½ discount from list.

**Bars.**—Word was received here Tuesday of a reduction in the prices of Soft Steel Bars and Bands to the basis of 1.30c., Pittsburgh, or 1.46½c., base, half extras, Chicago, in car lots. Iron Bars thus far have not been changed, remaining on the basis of 1.35c., Chicago, in narrow sizes, with half extras. Hoops are unchanged and very quiet at 1.71½c. rates, full extras, car lots, Chicago. Soft Steel Angles smaller than 3 inches on one leg are unchanged in their price of 1.45c., base, Pittsburgh, or 1.61½c., Chicago. Store prices are as follows: Iron Bars, 1.70c. to 1.75c., base, full extras; Steel Bars, 1.70c. to 1.75c., base, half extras; Hoops, 2.10c. rates, full extras.

**Merchant Steel.**—Following the decline in the price of Steel Bars, Merchant Steel prices have been reduced \$1 a ton from former prices, making the figures at Chicago in car lots: Open Hearth Spring Steel to general trade, 1.85c. to 1.90c.; Smooth Finished Machinery Steel, 1.71½c. to 1.76½c.; Smooth Finished Tire, 1.66½c. to 1.71½c.; Flat Sleigh Shoe, 1.51½c. to 1.56½c.; Concave and Convex Sleigh Shoe, apparently unchanged at 1.66½c. to 1.71½c.; Cutter Shoe, apparently unchanged at 2.25c. to 2.30c.; Toe Calk Steel, 2.01½c. to 2.06½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting at 52 per cent. in car lots and 47 per cent. in less than car lots; Railway Spring, carload lots, 1.71½c. to 1.86½c., with reductions for larger quantities.

**Merchant Pipe.**—Producers here continue to report a fair buying movement. Discounts are unchanged, as follows:

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
¼ to 1½ inch.....	69.35	53.35	67.35	51.35
¾ and 1½ inch.....	73.35	61.35	71.35	57.35
¾ to 6 inches.....	77.35	67.35	75.85	65.35
7 to 12 inches.....	72.35	57.35	70.85	55.85

**Boiler Tubes.**—Possibly a little less stagnant tone may characterize the Tube market. Prices are firm and unchanged, as follows:

	Steel.	Iron.	Seamless
			Steel.
1 to 1½ inches.....	46.35	41.35	52.35
1½ to 2½ inches.....	58.35	41.35	40.35
2½ inches.....	60.35	46.35	43.35
2½ to 5 inches.....	66.35	53.35	up to 4 in. 50.85
6 to 13 inches.....	58.35	41.35	.....

Carload buyers are given a two-point better discount than the above. The following list of prices of Tubes from warehouse is still nominally the basis of quotation, but it is not being adhered to very rigidly and large buyers are getting discounts considerably better. These nominal warehouse prices for shipment from Chicago store in less than car lots are as follows:

	Steel.	Iron.	Seamless
			Steel.
1 to 1½ inches.....	42½	37½	40
1½ to 2½ inches.....	52½	35	37½
2½ inches.....	55	37½	40
2½ to 5 inches.....	62½	47½	47½
6 inches and larger.....	52½	35	..

**Cast Iron Pipe.**—The city of Chicago placed its order of 1400 tons of 24-inch Pipe with an independent mill at Birmingham. Portland, Ore., bought 750 tons from the leading producers. The city of Eveleth, Minn., will buy 14,000 feet of 10-inch Water Pipe, bids to close September 30. Prices are held firm on the basis of \$25.50 for 4-inch Water Pipe, \$26.50 for 6-inch and heavier, and \$1 extra for Gas Pipe. These prices, however, will be shaded on very large lots.

**Old Materials.**—There seems to be somewhat of a rally following last week's break in prices. The result is a condition so chaotic that it is almost impossible to quote definite prices. The Illinois Central sold about 3300 tons last week, and the Chicago, Milwaukee & St. Paul and Chicago, Burlington & Quincy have each large lists out to close on September 22. Several other roads have smaller lists. The following prices may be taken as representing about the figures the railroads are getting for their materials. We quote, per gross ton:

Old Iron Rails.....	\$16.00 to \$16.50
Old Steel Rails, 4 feet and over.....	11.75 to 12.00
Old Steel Rails, less than 4 feet.....	11.00 to 12.00
Heavy Relaying Rails, subject to inspection.....	20.50 to 21.50
Heavy Relaying Rails, for side tracks.....	18.00 to 20.00
Old Car Wheels.....	11.50 to 12.00
Heavy Melting Steel Scrap.....	10.00 to 10.50
Mixed Steel.....	8.50 to 9.00

The following quotations are per net ton:

Iron Fish Plates.....	\$13.50 to \$14.00
Iron Car Axles.....	16.00 to 16.50
Steel Car Axles.....	14.00 to 14.50
No. 1 Railroad Wrought.....	11.75 to 12.25
No. 2 Railroad Wrought.....	10.75 to 11.25
Shafting.....	12.50 to 13.00
No. 1 Dealers' Forge.....	9.00 to 9.50
Wrought Pipes and Flues.....	8.00 to 8.50
Iron Axle Turnings.....	7.25 to 7.75
Soft Steel Axle Turnings.....	7.25 to 7.75
Machine Shop Turnings.....	7.00 to 7.50
Cast Borings.....	4.00 to 4.50

Mixed Borings, &c.....	4.00 to 4.50
No. 1 Mill.....	7.00 to 7.50
Country Sheet.....	5.00 to 5.50
No. 1 Boilers, cut to Sheets and Rings.....	8.00 to 8.50
No. 1 Cast Scrap.....	10.50 to 11.00
Stove Plate and Light Cast Scrap.....	9.00 to 9.50
Railroad Malleable.....	9.00 to 9.50
Agricultural Malleable.....	9.00 to 9.50

**Metals.**—Pig Tin has advanced 1c. a lb., but otherwise prices quoted last week are unchanged. Business shows a barely perceptible improvement. We quote as follows: Spelter is quoted at 5c. to 5½c. for car lots, and 5.25c. to 5¾c. for small lots. Casting Copper is being held at 12½c. and Lake at 13c. Pig Tin is now quoted at 29c. to 29½c. Pig Lead has advanced \$2 a ton, and is now quoted at 4.20c. for 50-ton lots, 4.30c. for car lots and 4.40c. to 4.50c. for less than car lots. Sheet Zinc is 6½c. for car lots of 600-lb. casks and 6¾c. for less than car lots. Old Metals are stronger, and several advances in prices are noted. We quote Copper Wire and Heavy, 11½c. to 11¾c.; Copper Bottoms, 10c.; Copper Clips, 11c. to 11¾c.; Red Brass, 9¾c.; Red Brass Borings, 8c.; Yellow Brass, Heavy, 7¾c.; Yellow Brass Borings, 6½c.; Light Brass, 5¾c.; Tea Lead, 4c.; Zinc, 4.25c.; Pewter, No. 1, 17½c.; Block Tin Pipe, 22½c.

**Coke.**—Connellsville producers generally are holding out for \$4.65, Chicago, for 12-hour Foundry Coke for 1905 delivery, quoting \$4.50 or in some cases \$4.40 for current business, and from \$4.05 to \$4.15 for Furnace grade. A large movement of Coke from the Stonega district to Birmingham has strengthened prices at all the Wise County ovens, bringing the oven prices up to and in some cases above the basis of Connellsville and giving the consumer all or part of the advantage of the 40c. a ton saving in freight enjoyed by ovens in that district on shipments into the Chicago territory.

## Philadelphia.

FORREST BUILDING, September 20, 1904.

So far as this district is concerned the Iron and Steel trades are absolutely unchanged from last week. Business is not bad, as compared with June and July, but it is much below what it should be to give even a moderate degree of activity. Some get a good share, others get less, the average being little beyond half to two-thirds of full capacity. The feeling is very hopeful, however, and as there appears to be genuine improvement in other districts it is believed that it will come this way in due course. It is a peculiarity of business in Eastern Pennsylvania that it maintains its activity long after other districts become dull, but it is equally slow in its recovery, so that while improvement cannot yet be claimed, there is a disposition to look for it in the near future, although it sometimes happens that the West makes a false start. It may therefore be said that while there is no desire to be skeptical, there is nevertheless a degree of conservatism, which will continue until there is at least some evidence that the improvement is not confined to one particular district or to one particular interest.

**Pig Iron.**—There is a good healthy demand for Pig Iron, and prices are undoubtedly firm. Some good sized lots have been taken at quoted rates, and it is claimed that several leading interests are willing to contract for deliveries during the first half of 1905, but sellers will not accept business at present prices except for this year's delivery. This is a somewhat optimistic position to assume, and may be for spectacular effect, but, all the same, it is not easy to buy Pig Iron for 1905 delivery without paying more or less of a premium on contracts of that kind. The situation is one of great uncertainty, nevertheless, and opinions differ even among the most experienced men. The crop situation is not definitely settled, but as far as wheat is concerned it is undoubtedly a failure. Corn may not be bad, but it will not be unusually good, even if it suffers no damage from frost. Cotton promises to be a full average, but there is a month or six weeks before it can be definitely estimated, so that there is very little to bull the market on so far as crops are concerned. There is plenty of money, but loans due the New York banks break all records—viz., \$1,200,000,000. Prices in the stock market have risen enormously, and as the railways expect to be heavy borrowers during the winter and spring months, the money situation is not favorably regarded, notwithstanding the reserve of \$30,000,000. These matters should give us pause before deciding that the Iron market is likely to take on great activity. Much could be said in favor of a movement of that kind, and it may come in spite of all conflicting influences, but the conservative element will keep close inshore until more light can be had than there is at the present time. An unbiased view of the situation would probably be that the last quarter of the year will develop a larger consumption of Pig Iron than in any of the three previous quarters, but on to-day's basis of production it is not likely that there will be any scarcity of Iron. A little spurt of activity is not unlikely, and it may develop into permanent improvement, but in any case it is not expected that prices will go beyond their present level. Some, if not all, of the



Tennessee companies' furnaces will be in operation in course of a few weeks, and it is not likely that Northern furnaces will make a market for them to sell on. Of course, this view of the situation may be changed by unforeseen events, but in the meanwhile it is the one most generally accepted by the leading interests. At the moment sellers have the situation well in hand and are firm at about the following quotations for city and nearby deliveries:

No. 1 X Foundry.....	\$15.00 to \$15.25
No. 2 X Foundry.....	14.25 to 14.50
No. 2 Plain.....	13.50 to 13.75
Standard Gray Forge.....	12.75 to 13.00
Ordinary Gray Forge.....	12.25 to 12.50
Southern No. 2 X Forge, rail.....	13.75 to 14.00
Basic.....	12.75 to 13.00
Low Phosphorus.....	17.50 to 18.00
Malleable Iron.....	14.50 to 14.75

**Steel.**—There is a better demand for Steel, and as prices are believed to be definitely settled, orders that have been held back will now be promptly placed. Ordinary Steel in good sized lots is quoted at \$21.50 to \$22, with the usual addition for special qualities.

**Plates.**—The demand is rather slow this week, but quite a large batch of orders was placed last week after the new price-list was announced. The general outlook is something better as regards demand, but the volume of business has not been materially increased since prices were reduced, but a fair degree of activity is looked for during the next few weeks. Prices are now quoted as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, rectangular plates 24 inches wide and under.....	1.43½	1.48½
Tank, Bridge and Boat Steel, over 24 inches wide.....	1.53½	1.58½
Flange or Boiler Steel.....	1.63½	1.68½
Marine, A. B. M. A. and Commercial Fire Box Steel.....	1.73½	1.78½
Still Bottom Steel.....	1.83½	1.88½
Locomotive Fire Box Steel.....	2.03½	2.08½
The above are base prices for ¼-inch and heavier. The following extras apply:		
3-16 inch thick.....	\$0.10 per lb. extra.	
Nos. 7 and 8 R. W. G.....	.15	"
No. 9 B. W. G.....	.25	"
Plates over 100 to 110 inches.....	.05	"
Plates over 110 to 115 inches.....	.10	"
Plates over 115 to 120 inches.....	.15	"
Plates over 120 to 125 inches.....	.25	"
Plates over 125 to 130 inches.....	.50	"
Plates over 130 inches.....	1.00	"
All sketches (excepting straight taper plates, varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches).....	.10	"
Complete Circles.....	.20	"
All the above f.o.b. Philadelphia.		

**Structural Material.**—Conditions in this department are similar to those in the Plate trade, and for the present there is no probability of change. Bridge work is fairly active, and there is a little more business at the shippards, although the tonnage is not large. The new list of prices is as follows: Beams, Channels and Angles, 1.53½c. to 1.65c., according to specifications, and small Angles, 1.50c. to 1.55c.

**Bars.**—The demand for Bars is undoubtedly improving, but there is still more or less uncertainty in regard to prices. The monthly meeting is expected to fix 1.30c., Pittsburgh, as the base price for both Iron and Steel Bars, although some favor 1.35c. as the minimum figure. Reports in regard to both sales and inquiries are of an encouraging character, and it is believed that a good business will be developed during the next few weeks.

**Sheets.**—There is a good day to day demand, but it is difficult to get any work ahead. So far the mills have been able to run fairly up to their full capacity, but, as we said before, it is simply on day to day business.

**Old Material.**—There is some scarcity of No. 1 Steel Scrap and holders are asking as high as \$12.50 in some cases. Sales have been made at \$12, however, and \$11.75 to \$12 would be inside figures at the present time, and not much to be had at either figure. All grades of Scrap are scarce and firmly held at full quoted rates. Bids and offers for deliveries in buyers' yards are about as follows:

No. 1 Steel Scrap.....	\$11.75 to \$12.50
Old Steel Axles.....	15.50 to 16.00
Old Iron Axles.....	18.00 to 18.50
Old Iron Rails.....	15.50 to 16.00
Old Car Wheels.....	11.50 to 12.50
Choice Scrap, R. R. No. 1 Wrought.....	14.50 to 15.00
Machinery Scrap.....	11.50 to 12.00
Low Phosphorus Scrap.....	16.50 to 17.00
Wrought Iron Pipe.....	11.00 to 11.50
No. 1 Forge Fire Scrap.....	10.00 to 10.50
No. 2 Forge Fire Scrap, Ordinary.....	8.00 to 8.50
Wrought Turnings.....	8.75 to 9.00
Wrought Turnings, Choice Heavy.....	10.00 to 10.50
Cast Borings.....	6.75 to 7.00
Stove Plates.....	9.50 to 10.00

George Westinghouse of Pittsburgh has resigned as a candidate for Presidential elector of the Thirtieth Congressional district. Mr. Westinghouse is ineligible to serve, because he is a director in a national bank.

## Cincinnati.

FIFTH AND MAIN STS., September 21, 1904.—(By Telegraph.)

From the general aspect of things it is quite apparent that the Pig Iron market is in a more satisfactory condition than it was a week since. While there is no apparent change in prices, a better feeling exists and inquiries are developing that give much promise for the future. Quite a number of consumers are beginning to figure on their next year's supply, but furnaces, both Northern and Southern, as a rule, are unwilling to make contracts for a later period than January 1, excepting at from 50c. to 75c. advance in prices. There is seemingly plenty of Southern Iron in the market for \$9.25, but, from what we can gather, the supply is gradually growing less, and the furnaces in this territory are endeavoring to strengthen the \$9.50 basis. Northern Iron is apparently firm, with most furnaces holding at \$12, although we learn of several round lots being sold on an \$11.50 basis. Southern Iron is still on a prohibitive basis in this territory, with the possible exception of where it is used for mixing purposes. The foundries of this city are still idle as a result of the molders' strike, which is no nearer a settlement than at the beginning. This naturally curtails the sale very materially to this class of consumers. The Pipe interests are still quite busy and are taking sprinkling lots when the opportunity offers. One or two sales of considerable tonnage have been made during the week. We understand that the Westinghouse people closed the deal for 8500 tons, 6500 tons of this amount being Northern and the remainder Southern for mixing purposes. Also the sale of some 7500 tons to a Louisville concern, calling for 4500 tons of Northern and 3000 tons of Southern. There is one inquiry on the slate from a large manufacturing concern in Central Ohio calling for 1000 tons, the bulk of which is to be Northern Iron. It is said that this contract is to be let to-day. There are whisperings that a strike among the miners in the Tennessee district is threatened, which, if true, will greatly demoralize business in this section. The situation in the Birmingham district is apparently somewhat better, one instance being noted where men have been secured to allow the opening of sufficient mines to furnish in a short time a full coal supply. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$12.50 to \$12.75
Southern Coke, No. 2.....	12.00 to 12.25
Southern Coke, No. 3.....	11.50 to 11.75
Southern Coke, No. 4.....	11.25 to 11.50
Southern Coke, No. 1 Soft.....	12.50 to 12.75
Southern Coke, No. 2 Soft.....	12.00 to 12.25
Southern Coke, Gray Forge.....	11.00 to 11.25
Southern Coke, Mottled.....	10.75 to 11.00
Ohio Silvery, No. 1.....	15.65 to 16.15
Lake Superior Coke, No. 1.....	13.15 to 13.65
Lake Superior Coke, No. 2.....	12.65 to 13.15
Lake Superior Coke, No. 3.....	12.15 to 12.65

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	\$16.25 to \$16.75
Lake Superior Car Wheel and Malleable.....	15.80 to 16.30

**Coke.**—While there is no evidence of any phenomenal tonnage being placed, there is a steady demand and a nice run of business. Some ovens are reported as having slightly advanced prices, but generally speaking very little change is apparent. There seems to be a tendency to increase the production of this commodity, possibly not so much by the merchant ovens as by those furnishing the Steel Corporation's supply. The Virginia product is still being shipped to the strike district in the South, but not in such large quantities as several weeks since. We quote the best grades of Connellsville Foundry at \$1.90 to \$2.10, f.o.b. ovens.

**Plates and Bars.**—Demand is increasing, and the market is daily becoming more active. Now that prices are firmly established by the different associations trade is expected to develop as a result of restored confidence. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.50c., with half extras; the same in smaller lots, 1.70c., with full extras; Steel Bars, in carload lots, 1.43c., with half extras; the same in smaller lots, 1.65c., with full extras; Base Angles, 1.53c., in carload lots; Beams and Channels, in carload lots, 1.53c.; Plates, ¼-inch and heavier, 1.53c., in carload lots; in smaller lots, 1.80c.; Sheets, 16-gauge, in carload lots, 2.05c.; smaller lots, 2.60c.; 14-gauge, in carload lots, 1.95c.; in smaller lots, 2.50c.; Steel Tire, ¾ x 3-16 and heavier, 1.63c., in carload lots.

**Old Material.**—Dealers report a fairly good week; in fact, better than it has been for some time past. Quite a considerable tonnage has changed hands, and a general good feeling prevails. Prices remain practically the same as far as we can learn. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$10.50 to \$11.50 per net ton; No. 1 Cast Scrap, \$10 to \$10.50 per net ton; Iron Rails, \$14 to \$14.50 per gross ton; Steel Rails, rolling lengths, \$10 to \$11 per gross ton; Relaying Rails, \$18 to \$19 per gross ton; Iron Axles, \$14 to \$15 per net ton; Car Wheels, \$10 to \$10.50 per gross ton; Heavy Melting Scrap, \$9.50 to \$10.50 per gross ton; Low Phosphorus Scrap, \$11.50 to \$12 per gross ton.

## Pittsburgh.

PARK BUILDING, September 21, 1904.—(By Telegraph.)

**Pig Iron.**—There is a fair amount of inquiry for Bessemer and Basic Iron, and we note sales of about 4000 tons of the latter, delivery over the balance of the year, at \$11.85 to \$12, at Valley furnace. A good deal of inquiry is in the market for Foundry Iron, the Westinghouse Electric & Mfg. Company having inquiries out for about 8000 tons, 3000 tons for its Cleveland works and 5000 tons for the Allegheny works. Another interest is in the market for about 1000 tons, and there are numerous smaller inquiries. Northern makes of No. 2 Foundry Iron are held at \$11.65 to \$11.75, Valley furnace, equal to \$12.50 and \$12.60, Pittsburgh. A leading Pipe interest has bought about 2500 tons of Southern Forge Iron on the basis of about \$12.85, Pittsburgh. This is a higher price than Northern Forge is selling for, but the higher price is paid on account of the Iron running higher in phosphorus. Northern brands of Forge Iron are held at \$11.75 to \$11.85, Pittsburgh, while some sellers refuse to sell at less than \$12, Pittsburgh. A sale of 1000 tons of local Forge is reported at the latter price.

**Billets.**—The new prices on Billets, Sheet and Tin Bars are given elsewhere in this issue. As yet there is very little doing in Billets or Bars, but some tonnage is expected to be placed shortly by consumers who have been holding back waiting for the lower prices. We quote Bessemer and Open Hearth Billets up to 0.25 carbon at \$19.50, Sheet and Tin Bars, long lengths, \$21.50, f.o.b. Pittsburgh district, to which freight to destination should be added.

(By Mail.)

A meeting of the Billet and Steel Bar Associations was held in the Union Club, this city, on Monday, September 19, at which a reduction of \$3.50 per ton was made in official prices of Bessemer and Open Hearth Billets, \$2 a ton on Sheet and Tin Bars, and \$1 a ton on Steel Bars—all effective from September 19. A radical change has been made by the Billet Association in the fact that all quotations on Billets, Sheet and Tin Bars are now made f.o.b. Pittsburgh, to which actual freight to destination is added. Under the former schedule of prices the mills absorbed part of the freight, which made comparatively low delivered prices at many points, but this has all been done away with. We print elsewhere a schedule showing delivered prices of Billets, Sheet and Tin Bars to some of the principal points of delivery. It is stated that the new prices are going to be rigidly observed by the mills, and the Lackawanna Steel Company is a party to the agreement. The cut of \$3.50 a ton in Billets is not quite as heavy as it otherwise would be had the former price of \$23 been strictly held, which was not the case, as Billets have sold in the past two or three weeks at very close to \$20 a ton, or perhaps lower.

We note a moderate inquiry for Pig Iron, but the views of buyers and sellers as to prices are far apart, and for this reason only a limited tonnage is changing hands. Sales of Chilled Basic Iron for delivery in last three months of the year are reported on the basis of \$12, Valley furnace. Northern No. 2 Foundry Iron for prompt shipment has sold in small lots at \$11.50 to \$11.60 at furnace, while for the balance of year delivery from \$11.65 to \$12 at Valley furnace is quoted. Northern Forge Iron is about \$11.75, Pittsburgh, for balance of the year shipment.

A moderate amount of tonnage is being placed in Finished Material, and there have been no important changes in prices, with the exception of Steel Bars, Angles, Channels and Tees under 3 inches, which are reduced \$1 a ton.

**Ferromanganese.**—We do not hear of any sales, and continue to quote foreign and domestic Ferro at \$41 to \$41.50, delivered, for large lots. For small lots, \$42 to \$43 is quoted.

**Muck Bar.**—The market continues very quiet and is rather weak. We quote best grades of Muck Bar, made from all Pig Iron, at \$23 to \$23.50, delivered to mills in the Pittsburgh district.

**Rods.**—Consumers of Rods have been holding off placing orders, awaiting action in regard to price of Billets. Now that these have been reduced \$3.50 a ton over former official prices, it is probable a material reduction will be made in price of Rods, which have been held nominally at \$27, Pittsburgh, for several weeks. We, therefore, omit quotations on Rods this week.

**Skelp.**—We note a sale of 1000 tons of Grooved Steel Skelp, ordinary widths, at 1.30c., f.o.b. Pittsburgh. The Skelp mills are well filled up with tonnage, some good sized contracts for both Iron and Steel Skelp having been placed in the past month. We quote Grooved Iron Skelp at 1.40c., Sheared Iron Skelp, ordinary width and gauges, at 1.45c., while for narrow sizes and light gauges Sheared Iron Skelp has sold as high as 1.55c. Grooved Steel Skelp is held at

1.30c. and Sheared at 1.35c. to 1.40c.; all these prices are f.o.b. cars delivered to mills in the Pittsburgh district.

**Steel Rails.**—The situation is very quiet, and it is probable little will be done until the Rail mills have fixed prices for next year. The mills are hurrying shipments of Rails into Canada, desiring to deliver as much tonnage as possible before the duty of \$7 a ton goes into effect on November 30 next. There is a moderate inquiry for Light Rails, on which some low prices are being made. We quote Standard Sections at \$28, at mill, the mills equalizing freights, while Light Rails are selling at \$18.50 up to \$23, depending on weights.

**Structural Material.**—The Baltimore & Ohio Railroad has placed about 1700 tons of Material for bridges, the business going to McClintic-Marshall Construction Company. The contract for a roundhouse placed by the Buffalo & Susquehanna Railroad with the McClintic-Marshall Company has been greatly exaggerated in the daily press and amounts to between 200 and 300 tons, instead of 10,000 tons as reported. The Cambria Steel Company has taken a contract for a round tonnage of Steel Bolts for the New York tunnel. A reduction of \$1 a ton has been made in price of Angles, Channels and Tees under 3 inches. We quote: Beams and Channels, up to 15-inch, 1.40c.; over 15-inch, 1.50c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.40c.; Angles, 8 x 8 and 7 x 3½ inches, 1.50c.; Zees, 3-inch and larger, 1.40c.; Tees, 3-inch and larger, 1.45c. Under the Steel Bar Card, Angles, Channels and Tees under 3-inch are 1.40c., base, for Bessemer and 1.45c., base, for Open Hearth, subject to half extras on the Standard Steel Bar Card.

**Plates.**—The American Shipbuilding Company has recently placed the Plates and other Shapes for three large lake boats, the tonnage for one of these going to Carnegie Steel Company, for another to Cambria Steel Company, and for the third to Jones & Laughlin Steel Company, the latter contract having just been placed. Each of these boats will require from 2200 to 2500 tons of Plates and other Shapes, so that the total business amounts to 7000 tons or more. The general demand for Plates is rather quiet, but it is believed will soon show improvement in view of the general better feeling in the trade. Only a small tonnage is coming in from the car shops, the railroads not having placed any large orders for Steel cars for some time. We quote: Tank Plate, ¼ inch thick, 6¼ to 24 inches wide, 1.30c., base; over 24 inches wide and up to 100 inches in width, 1.40c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Per pound extra.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges.....	\$0.10
Gauges No. 7 and No. 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 inches.....	.05
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.25
Plates over 125 to 130 inches.....	.50
Plates over 130 inches.....	1.00
All sketches (excepting straight taper Plates, varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches).....	.10
Complete Circles.....	.20
Roller and Flange Steel Plates.....	.10
Marine, "A. B. M. A." and ordinary Fire Box Steel plates.....	.20
Still Bottom Steel.....	.30
Locomotive Fire Box Steel.....	.50
Shell grade of Steel is abandoned.	

**TERMS.**—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent per annum, and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast not included.

**Sheets.**—The Sheet trade is in fairly satisfactory shape, a moderate amount of new tonnage being placed, while prices are quite firm. The official reduction of \$2 a ton in price of Sheet Bars is actually very much less than that, for the reason that the Steel mills now base all prices on Sheet Bars, f.o.b. Pittsburgh, to which actual freight to destination is added. Under the former price of \$23.50 for long Bars the mills made low delivered prices to most points, absorbing in some cases nearly the entire freight. The actual reduction on Sheet Bars to such points of delivery amounts to only \$1 a ton or slightly more. Several Sheet mills have recently bought Bessemer Sheets in the open market, stating that they could buy Sheets at a lower price than they could make them and pay the former price of \$23.50 for Bars. We quote No. 26 Black Sheets, box annealed, one pass through cold rolls, at 1.95c.; No. 27, 2c.; No. 28, 2.10c., in carloads and larger lots. Galvanized Sheets are sold at about 80 and 7½ per cent. off, but on very desirable specifications a few mills occasionally name 80 and 10 per cent. off in large lots. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.59c.; Nos. 25 and 26, 2.77c.; No. 27, 2.96c., and No. 28, 3.14c. Jobbers charge the usual advance over these prices on small lots from store.

**Iron and Steel Bars.**—At a meeting of the Steel Bar Association, held in Pittsburgh, Monday, Sept. 19, the price



of Bessemer Bars was reduced \$1 a ton, or from 1.35c. to 1.30c. The reduction will not cut much figure, for the reason that many leading consumers had covered at the old price and did not pay the advance of \$1 a ton when it was made last March. A fair amount of tonnage is being placed in Iron and Steel Bars, but buyers continue to place orders mostly for small lots and actual needs. We quote Bessemer Steel Bars at 1.30c., base; Open Hearth Bars at 1.35c., base, with the usual differentials for small lots. We quote Refined Iron Bars at 1.25c. to 1.30c., f.o.b. Pittsburgh.

**Hoops and Bands.**—The price of Steel Bands has been reduced \$1 a ton, or from 1.35c. to 1.30c., extras as per Steel Card. No official reduction has been made in Steel Hoops, which are held at 1.55c., but most consumers are covered at lower prices.

**Merchant Pipe.**—Tonnage in Pipe is only fair and is not sufficiently large to give the mills full work. For this reason both jobbers' and consumers' discounts are slightly shaded by the outside mills. Consumers' discounts on carloads, which, however, are shaded more or less, depending on the order, are as follows:

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
1/4 and 3/4 inch.....	71	55	69	53
3/4 and 1 1/2 inch.....	75	63	73	61
1 1/2 to 6 inches.....	79	69	77 1/2	67 1/2
7 to 12 inches.....	74	59	72 1/2	57
Extra strong, plain ends, 1/2 to 3/4 inch.....	64	52	62	50
1/2 to 4 inches.....	71	59	69	57
4 1/2 to 8 inches.....	67	55	65	53
Double extra strong, plain ends, 1/2 to 8 inches.....	60	49	58	47

**Boiler Tubes.**—Demand continues quiet and there is some unevenness in prices. Discounts to consumers in less than carloads, which are sometimes shaded, are as follows:

	Steel.	Iron.
1 to 1 1/4 inches.....	48	43
1 1/4 to 2 1/4 inches.....	60	43
2 1/4 inches.....	62	48
2 1/2 to 5 inches.....	68	55
6 to 13 inches.....	60	43

In carload lots discounts are two points lower than the above.

**Merchant Steel.**—The reduction of \$1 a ton in price of Steel Bars carries a similar reduction in some kinds of Merchant Steel. Tonnage is light, the implement makers holding back contracts waiting for lower prices. We quote: Tire Steel, 1.50c.; Plow Slabs, 1.50c.; Sleigh Shoe, flat, 1.40c.; Cutter Shoes, 2c. Some very low prices have recently been made on Open Hearth Spring Steel, which we quote at 1.85c. to 2c., depending on the order. Crucible Tool Steel is 5 1/2c. to 7c. for ordinary grades and 8c. up to 15c. for best grades. Cold Rolled Shafting is 52 per cent. off in carloads and 47 per cent. in less than carloads, delivered in base territory.

**Spelter.**—While demand for Spelter is quiet, prices are quite firm. We quote best grades of Western Spelter at 5.03 1/2c. to 5.07 1/2c., Pittsburgh, equal to 4.90c. and 4.94c., St. Louis.

**Tin Plate.**—Demand for Tin Plate is very quiet, the mills running nearly altogether on contract. It is said the leading Tin Plate interest is operating only about 50 per cent. of its entire capacity. We quote 100-lb. Cokes at \$3.25, net, f.o.b. Pittsburgh district; terms 30 days, or 2 per cent. off for cash in 10 days.

**Coke.**—About 600 additional ovens were started up last week, and the H. C. Frick Coke Company is now operating 85 per cent. of its own capacity. Strictly Connellsville Furnace Coke is held at \$1.45 to \$1.50, and Connellsville 72-hour Foundry Coke at \$1.85 to \$2 a ton. The estimated output of the Upper and Lower Connellsville regions last week was about 260,000 tons. Main Line Furnace Coke was quoted from \$1.30 to \$1.40 a ton, and Foundry from \$1.60 to \$1.75 a ton.

**Iron and Steel Scrap.**—The Scrap market is rather quiet in demand, and it is likely prices will go off to some extent on account of the reduction of \$3.50 a ton in Billets. We quote Heavy Melting Scrap at \$11.50 to \$12; No. 1 Wrought Scrap, \$12.50; Cast Iron Boring, \$6.50 to \$6.75; Wrought Turnings, \$9 to \$9.50; Bundled Sheet Scrap, \$9 to \$9.50; Iron Car Axles, \$18; Old Rails, long pieces, \$13; short pieces, \$11.50 to \$12. All above quotations are for gross tons. We note a sale of 250 tons of No. 1 Wrought Scrap at \$12.50 in gross tons, delivered to a mill in the Pittsburgh district.

The National Association of Engine and Boat Manufacturers will hold a show at Madison Square Garden, New York, from February 21 to March 9, in conjunction with the Sportsmen's Exhibit Company. This will be the first national show wherein the engine and boat building industry has taken a prominent part.

## Cleveland.

CLEVELAND, OHIO, September 20, 1904.

**Iron Ore.**—The contracts which it was expected would be closed have not materialized and the market seems to hold steady, with light buying, at the old list of prices. There is some talk of more buying later on. It is reported that some of the shippers have been bringing down an amount of ore considerably in excess of their sales, expecting to sell it off the dock when the demand appears. This is a provision against a possible shortage next spring, of which so much has been said in Ore shipping circles this year. Prices have not changed, being \$3.25, f.o.b. Lake Erie docks, for Bessemer Old Range, \$3 for Bessemer Mesaba, \$2.60 to \$2.75 for non-Bessemer Old Range and \$2.40 to \$2.50 for non-Bessemer Mesaba. The rates of carriage have remained about stable. The prospects of a light movement of wheat this fall and the exhaustion, practically, of the corn movement leave little demand for tonnage except from the Ore trade. This does not promise very well for improved freight rates on the movement of Ore, and the market hangs about as it has been at 65c. from Duluth, 60c. from Marquette and 50c. from Escanaba.

**Pig Iron.**—There has been very little buying in Foundry Pig Iron during the last week. There is some strength, but the buyers have not completely revived from their recent scare. Until the industrial situation is completely established upon a firm footing the local buyers are not disposed to cover their needs any further than they have covered them already. The furnaces are easy, through the buying movement which has gone before, and they are not forcing things. For the most part, the furnaces are holding for \$12 at the furnace for No. 2 Foundry. In many instances the furnaces are holding for \$12.25 in the Valleys. There is occasionally some buying of Bessemer and Basic, but the market has heard of no big sales in this immediate territory. The prospective buying, due to the resumption of some of the mills, has not taken place, although there have been some inquiries. The volume of the business in sight and the price being paid at the present time have not been sufficient to warrant any of the idle furnaces resuming activity. The call for Malleable is about as it has been. The market has been steady, with a firm tone to prices. We revise and quote Pig Iron prices, f.o.b. Cleveland, as follows:

Northern Coke, No. 1 Foundry.....	\$13.35 to \$13.60
Northern Coke, No. 2 Foundry.....	12.85 to 13.10
Northern Coke, No. 3 Foundry.....	12.35 to 12.60
Southern Coke, No. 1 Foundry.....	13.85 to 14.10
Southern Coke, No. 2 Foundry.....	13.35 to 13.60
Southern Coke, No. 1 Soft.....	13.85 to 14.10
Southern Coke, No. 2 Soft.....	13.35 to 13.60

**Finished Iron and Steel.**—The drop in the price of Bars, which came Monday, was a surprise to the trade in this territory. The action of the association was expected to be a reaffirmation of the prices which had ruled heretofore. There was one big element of weakness and uncertainty, nevertheless. The agricultural implement works did not understand which way the crops were going to turn and for that reason have been holding off in their buying. The other lines of buyers, however, have inclined to cover a good part of their needs and have not regarded the prices. It is too soon after the decline now to state what influence this reduction will have upon the action of the buyers. It seems, however, that most of the larger ones will be more influenced, in this territory at least, by the outcome of the crops than by the price of Steel. There is a good, steady demand through Northern Ohio from the finishing mills, which will be affected by this action. It is intimated that an improved business may be expected from this source. In the other lines there have been better buying orders. One traction company placed an order for 7000 tons of Steel Rails, and other traction companies are buying still more. The first big order was for a new line which will be started soon. The other purchases have been for extension work. The price has been \$28 a ton, Pittsburgh. The buying of Structural Shapes and Plates has been better. Trade advices are that the reduction in the price is generally satisfactory and is considered final. There is a disgruntled customer now and then who holds for a lower price, but the generality of buyers are content with the new prices. No big contracts which are really worthy of specialization have been made, but it is indicated by the advices that a good general buying of lots running 300 to 700 or 800 tons has been made. In some instances Plate contracts covering six months' delivery have been placed. There is a good possible demand from the shipbuilding companies also. The Sheet situation is virtually unchanged. The larger mills are getting a good deal of business, but they are merely taking some business which has been going to the smaller mills. It is questionable whether the aggregate volume of the trade has increased much. The prices have held unchanged at 2.05c. to 2.10c. for No. 27 Black Sheets, in car lots at mill, while the same gauge as a basis is selling unchanged at 2.50c. out of stock. Most of the sales now are out of stock.

**Old Material.**—The slightly better demand which has appeared for Scrap has brought out a surprisingly heavy

supply of that material. The dealers have been met in their efforts to advance prices by this flood of material, which has kept the market weak. The prices have not declined, but it has been an effort to keep them steady. We continue to quote, all gross tons: Old Steel Rails, \$12; Old Car Wheels, \$12; Heavy Melting Steel, \$12. All net tons: Cast Borings, \$4; No. 1 Busheling, \$10.50; No. 1 Railroad Wrought, \$12 to \$12.50; Wrought Turnings, \$7; Iron Car Axles, \$16 to \$17; No. 1 Cast, \$10.50 to \$11; Stove Plate, \$7 to \$7.50.

## Birmingham.

(By Telegraph.)

BIRMINGHAM, ALA., September 21, 1904.—The Woodward Iron Company is resuming operations. There is no change in Iron quotations, and a very small business is being transacted. Operators are gradually adding to their forces and increasing their output. A good share of business is being offered to first quarter of next year, but, as a rule, is declined. The situation is clearing, and the mine operators appear to be gaining ground. The output of Coal is increasing, as is the production of Coke, but while the district is gradually getting to a normal condition, it will be some time before it is reached. What business is being done is on the basis of \$9.50 for No. 2 Foundry. There have been so far no violations of law and order of any moment, and none is now expected. The Battelle Furnace is now making Iron, but the district output is materially below its normal capacity.

## Self Propelling Fire Engines.

Now that the automobile has become so common as a vehicle for pleasure and for commercial purposes, it seems strange that the adoption of self propelling fire engines is so backward. Apparently all the conditions favor their use; power is necessarily a part of the equipment for the driving of pumps, and it is reasonable to place more dependence on machinery than on animals when the certainty of reaching the destination in the shortest time is of such vital importance. In a paper on the subject recently read before the International Association of Fire Engineers at Chattanooga, Tenn., and reprinted in the *Weekly Underwriter* of September 17, W. F. Cheswell, chief of the Boston (Mass.) Fire Department, gave many interesting facts concerning the history of self propellers and the experience had of them in that city.

The first engines of the kind were successfully operated by New York and Detroit as far back as 1869. The first used in Boston was placed in service in 1872, and located in the suburbs. It was a much smaller machine than our more modern self propeller, having but 7-inch cylinders, 4½-inch pumps, with an 8-inch stroke, its water capacity being 400 gallons a minute. The propelling motion was on one side of the engine only. Numerous complaints were received that it frightened horses, causing accidents, and it was discontinued after being in service about three years. The two self propelling engines now in service in Boston were purchased and installed by Col. H. S. Russell, the present Fire Commissioner, one in 1897, and the other a year later. He placed them in the very heart of the hazardous fire section, not as emergency apparatus, but with a fairly busy running card, so that they have averaged 50 runs a year. They are both of like construction and dimensions, weighing 17,000 pounds; diameter of cylinder, 9¼ inches; diameter of pumps, 5¼ inches; length of stroke, 8 inches; capacity, 1200 to 1300 gallons a minute. When at their stations 90 pounds of steam pressure is required on the gauge at all times, this steam being supplied from a heater in the basement of the station and connected by steam pipes to the engine. This heater consumes about 3 tons of coal in a month.

Upon receipt of an alarm to which the engine responds it is immediately started, the fire under the boiler not being lighted until after crossing the threshold, the boiler gradually gaining steam until, on arrival at the fire after the shortest run, the gauge will register 125 pounds. After the engine is placed in the position required a key that connects the driving gear to the main shaft is removed, and an ordinary steam fire engine is then ready to work. These engines are equipped with a

fresh water tank holding 100 gallons that, in case of necessity, can be refilled from any hydrant. A short piece of 2½-inch hose is carried for this purpose, but as they run 3 miles without refilling the tank, it has never been necessary to stop for water.

These self propelling engines have given excellent service, and not one instance is recorded where they failed to report on the scene of the fire in good season. There is an instance when in responding to an alarm during a very heavy snowstorm an engine drawn by fire horses was stalled, and one of these propellers cut through the same snow drift without much ado. In ordinary going they can be driven as fast as required and can climb quite a grade; in fact, one of them is on the running card to a box at the top of a long hill in preference to an engine drawn by horses located at the same station. They can be housed after returning from response to an alarm very quickly and without much work. Their repairs have not been noticeably in excess of horse engines. The spur tires are renewed but once a year on the forward wheels and three times on the rear wheels. There is no record of damage being done by horses becoming frightened at the noise of these engines responding to an alarm; in fact, they are seen so frequently in the streets that they attract no more attention than any other apparatus. At a fire of some magnitude, where extra alarms are necessary, these machines, "the heavy artillery" of the fire service, with their great water capacity, which in the event of such fires is absolutely necessary, show their worth.

They will not give satisfactory results unless intelligently operated, and much of their success is due to the ably and painstaking manner in which they are handled by the engineers and tillermen, who are constantly drilled in their duties.

## Blacksmiths' Agreement in New York Shipyards.—

An agreement has been signed between representatives of the blacksmiths in the New York shipyards, numbering about 1000 men, and of the New York Metal Trades Association, by which the present wages will be continued. The wages in all the shop trades have been going down for some time. In consideration of this the representatives of the blacksmiths withdrew a demand for the closed shop, which threatened at first to cause trouble, and the agreement, which expires on July 31, 1905, is on the open shop basis. It is provided in the agreement that there shall be no sympathetic strikes, and that no persons other than those authorized by the employers shall interfere with the workmen during working hours. Among the firms included in the agreement are: The Townsend-Downey Shipbuilding Company, Crescent Ship Yard Company, Elizabethport; Atkinson & Co., Hoboken; Burlee Dry Dock Company, Staten Island; W. & A. Fletcher Company, Hoboken; Gas Engine & Power Company, and Charles L. Seabury Company, Morris Heights; Quintard Iron Works, Logan Mfg. Company and Riley Repair & Supply Company, New York.

**Follansbee Brothers Company.**—Follansbee Brothers Company of Pittsburgh, have put in successful operation its new sheet and tin plate plant at Follansbee, near Wheeling, W. Va. The plant contains six tin and two sheet mills, all of which are in operation. The Brooke County Improvement Company, which is an identified interest of Follansbee Brothers Company, is building nearly 100 houses on a site of land near the tin and sheet mill, to be occupied as homes by the employees of the plant.

The strike of the employees of the American Tube Works, Somerville, Mass., has been declared off after a duration of about four months. The union has so formally voted, but previous to this action a number of the members of the union had returned to work. The demand was for an increase in wages, and the company has made no concessions. As a considerable number of new men were employed before the strike was ended, not a few of the strikers have found no work waiting for them.



## The New York Machinery Market.

NEW YORK, September 21, 1904.

There have been no developments of unusual importance during the last week. Business has been fairly good, and the feeling that conditions will continue to improve still exists. Some good contracts have been placed, although no transactions of especially large proportions are reported. Several good sized inquiries have been added to the list of propositions which are being figured upon by the trade. Some comparatively small orders were placed by large concerns who have been holding aloof from the market of late. This is taken as a healthy sign, because it seemingly predicts a re-entering into the market of these interests. Several of these buyers have extensive inquiries out which have not been closed as yet, showing that they are in need of considerable machinery. It is natural, therefore, that especial interest should be manifested in the purchases, small though they be, of these companies. A decision on the part of these concerns that the present is a good time to buy would mean a good deal to the machinery trade of the country.

One of the most interesting bits of news of the week is that the machinery required by the Japanese Government for installation in its various arsenals, shipyards and railroad shops is being purchased in this country. The lot of 100 lathes, which we have previously referred to, has been divided up among several New York machinery merchants. While the original specifications allowed a little over a month as time of delivery, the matter finally settled down to tools in stock. Consequently, practically all of the lathes ranging from 20 to 24 inch swing carried in stock by local merchants or their manufacturing connections were taken up. Manning, Maxwell & Moore, the Prentiss Tool & Supply Company and the Niles-Bement-Pond Company were the chief recipients of the orders. A considerable quantity of machinery in addition to these lathes has been purchased from these interests, and we understand that a nice lot of tools is still to be decided upon. The purchases are being made by direct agents of the Japanese Government through the three principal Japanese exporting houses, Okura & Co., 11 Broadway; Takata & Co., 10 Wall street, and Mitsui & Co., 445 Broome street. The two first named companies have been conducting most of the present machine tool purchases.

Further orders have been placed by the Erie Railroad. They have been scattered among the principal machinery houses in this city. Nothing new has developed in connection with the inquiries of the Philadelphia & Reading, Lehigh Valley or Pennsylvania railroads. The information to be gleaned in the trade concerning the last named company is that nothing will be done with the machine tool bids at present, but that purchases will be made very soon of the power plant equipment required at the new shops at Olean, N. Y. This equipment is of considerable size.

No orders were placed by either of the contracting firms who are building the Pennsylvania Railroad tunnels. Orders will be placed very soon, however, by both of these concerns for high speed engines. S. Pearson & Son, Limited, will require three 130 horse-power and three 225 horse-power units. Mr. Japp informs us that these will be bought within a fortnight. The O'Rourke Engineering & Construction Company will require six high speed engines of 160 horse-power each. Three are to be placed in the plant at Weehawken, N. J., and three in the plant at the foot of Thirty-fourth street, New York. An impression has gone forth in certain sections of the trade that the orders for the O'Rourke engines have been placed. This is officially denied, however, and we learn from a representative of the company that no particular time has been set for closing the matter.

The Pearson Company is receiving bids on the accessories to be used in the air compressor plant, the compressors for which they have purchased from the Ingersoll-Sergeant Drill Company, as we noted last week. There has been some question as to whether the contract of the latter company included the complete plant, with all auxiliary equipment, as well as the compressors. The apparatus to be purchased by the Pearson Company includes two complete gravity oiling systems, ten feed water controllers, four forced draft fans and engines, six 12 and 7 x 12 inch duplex feed pumps, two 3000 horse-power open feed water heaters, six surface condensers, six air and circulating pumps for condensers, two hot well pumps, six 3000-gallon centrifugal circulating pumps with engines, six oil separators for separating oil from exhaust steam, two air intake conduits and stacks, all steam piping and covering, exhaust piping and covering, steam separators, boiler feed piping, circulating water piping, guard rails and drip system piping.

While no further details can be learned concerning the new power station to be built by the New York Edison Company adjoining its present Waterside Station, there is every evidence that the matter is being pushed along very actively. Specifications are being issued for the auxiliary equipment, and bids are now being received for the heating and ventilating apparatus and other appliances. The preliminary plans for the building were filed with the municipal

authorities yesterday. The same conditions prevail in the case of the extension to the Kent avenue station of the Brooklyn Rapid Transit Company. It is believed in the trade that the purchases for this station will be made before the contracts are given out for the balance of the equipment required for the New York station. Both of these matters are being handled by the engineering department of the New York Edison Company, 55 Duane street, New York.

Everything is moving along favorably in connection with the establishment of the large car building plant of the Canada Car Company, to which we referred last week. During the last week a tract of land, consisting of some 35 acres, located on the outskirts of Montreal, was purchased and specifications were issued for bids for the foundations. The plans for the shop equipment are not sufficiently matured to warrant mention at this time.

Specifications are now out for the equipment of the proposed new pumping station to be erected at New Orleans, La.

Sealed proposals will be received at the office of the Sewerage and Water Board, 602 Carondelet street, New Orleans, until 12 o'clock noon, Wednesday, November 9, for furnishing and erecting the following water works pumping machinery: Four 20,000,000-gallon pumping engines, to work against a 218-foot head; three 40,000,000-gallon centrifugal pumps, to work against a 25-foot head; three engines to operate these centrifugal pumps; two 150-kw. 550-volt direct current generators; two engines to drive these generators; six 400 horse-power water tube boilers; also all steam and water pipe connections and other appurtenances complete for operation within and connecting the boiler and pump house buildings. F. S. Shields is secretary.

M. Eugene Blin of Paris, junior member of the firm of Malicot & Blin, automobile manufacturers, with works at Aubervilliers, France, is in this country. He has visited a number of machinery builders in this vicinity and in New England looking over various types of machine tools. His investigations in this connection are preliminary to the placing of orders for new machine tools amounting to about \$60,000. When last we heard of Mr. Blin he was in St. Louis, where he was attending the Exposition in the capacity of juror in connection with the automobile awards. Before returning to the East he intends visiting the large machine tool builders in Ohio and Illinois. It is probable that no orders will be placed until after his return to France.

The R. E. Olds Company, which has recently been organized for the manufacture of automobiles, intends constructing very extensive works at Lansing, Mich. A few weeks ago a representative of this company was in this city looking up machinery equipment. We are advised now that this was but for a temporary shop, which has since been erected. Plans are now being prepared for an extensive new plant. The list of machinery and tools to be installed has not been prepared as yet.

In another column reference is made to the organization of the Platt Iron Works Company to succeed the Stillwell-Bierce & Smith-Vaile Company of Dayton, Ohio. We are advised by George W. Neff, the New York representative of the new company, that at a meeting of the Board of Directors last Friday it was voted to expend from \$75,000 to \$100,000 for new machinery and tools to bring the plant up to a thoroughly efficient basis of manufacture. We understand that the extremely diversified lines of machinery produced by the old company will be narrowed down to a few standard classes.

The Oregon Short Line has broken ground for extensive shops, to be erected on the outskirts of Salt Lake City, Utah. At the New York offices of the Union Pacific Railroad, which is controlled by the same interests as the Oregon Short Line, it was stated that the latter road had long ago outgrown its present shops in Salt Lake City, and had for some time been much in need of increased facilities for repairing cars and locomotives. Consequently a large site was purchased outside the city, where it is the intention to build shops of far greater proportions than the old ones, and which will be equipped for doing all classes of repair work. When the new buildings are completed the machinery now in use will be moved to the new site. The old buildings are to be razed and a new depot is to be erected on the ground they occupy.

Extensive improvements are being made to the plant of Davies & Thomas of Catasauqua, Pa., the firm which secured the contract for furnishing some 52,000 tons of finished cast iron rings for the Pennsylvania Railroad tunnels under the East River. The foundry is being extended by a new building, to be 50 x 200 feet, of brick and steel construction. The contract for the structural work has been awarded to the Berlin Construction Company of Berlin, Conn. The cupola capacity of the foundry will be increased 100 tons a day, and the cupolas will all be equipped with electric hoists and conveyors to facilitate the handling of the raw materials. A new electric generating outfit will be installed having a capacity of 300 kw., and making a total of between 750 and 800 kw. for the entire generating capacity of the plant. Orders have been placed for about \$50,000

worth of special machinery for finishing the tunnel rings, and 20 electric traveling cranes of a capacity of 2 tons each will be purchased.

A fair sized amount of equipment, including blowers, small engines, gas purifying apparatus and other machinery, will be required by the Bronx Gas & Electric Company, New York, which is to build a new gas house at Avenue A and Ninth street. The building will be 37 x 168 feet.

The contract for two 750-kw. steam turbo-generator units for the Boston Navy Yard has been awarded to the Warren Electric Mfg. Company, Sandusky, Ohio, at its bid of \$47,500. This contract is of more than ordinary interest, in that it announces the entrance into the steam generator field of a new turbine, which is the invention of E. C. Crocker. Mr. Crocker was formerly connected with the United States Steam Turbine Company, Hartford, Conn., whose turbine was illustrated in *The Iron Age* some time ago.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until October 4 for a quantity of supplies for the Portsmouth, Boston, Newport and New London navy yards, including electric motors, milling machines, Hendey-Norton engine lathe, Fitchburg shaper, folding machines, &c.

Under bids opened August 30 for machine tools for the League Island and Washington navy yards and the Naval Academy, Annapolis, the following awards have been made:

C. & C. Electric Company, New York, class 16, two 5 horse-power multipolar direct current motors, \$210.

Manhattan Supply Company, New York, class 17, one sewing machine table with motor, \$47.40.

Sherman-Brown-Clements Company, New York, class 18, one hydraulic wire rope cutter, \$74.75.

The Fairbanks Company, New York, class 20, one weighing machine, \$210; class 21, one platform scales, \$51.

No action has been taken on the remaining classes.

Under bids opened August 9 for the Portsmouth, Boston, New York and League Island navy yards the Niles-Bement-Pond Company, New York, has been awarded class 8, one outside molding machine, 13 x 8 inches, at its bid of \$1717, and class 10, one heavy power feed cut off sawing machine. has been awarded to George Place, New York, at his bid of \$1127.

The Brooklyn Rapid Transit Railroad Company will convert a building which it owns on the corner of Fifth avenue and Thirty-sixth street, Brooklyn, into a repair shop. It will also erect a new building, 110 x 140 feet, on the property, and will soon be in the market for a complete machine shop equipment.

## Metal Market.

NEW YORK, September 21, 1904.

**Pig Tin.**—Prices have fluctuated widely throughout the week, this market advancing and declining in unison with the changes cabled from London. On Monday the highest prices were reached, when London cabled £128 12s. 6d. and when this market reached 28½¢. for spot. Since then the tendency has been downward and the net results show a sharp decline to-day. The closing prices to-day in this market are 27.62½¢. for spot and 27.60¢. to 27.80¢. for September and October deliveries. The London market at this writing is £126 15s. for spot and £127 5s. for futures. Throughout the entire week business has been very slight, and it is clearly evident that consumers in the interior are not buying. The arrivals thus far this month amount to 1810 tons, while 1345 tons are now afloat. The present indications point to very small deliveries for the month of September.

**Copper.**—Prices have been advanced, and the tone of the market is considerably stronger. During the early portion of this week a good amount of business for export account was transacted, but so far as domestic business is concerned, conditions are entirely unchanged. Quotations at present are as follows: Lake, 12.75¢. to 13¢.; Electrolytic, 12.75¢. to 12.87½¢., and Casting, 12.50 to 12.62½¢. The London market is also somewhat higher, both spot and futures being quoted £58 2s. 6d. at the close to-day. Best Selected has advanced to £61 15s., an advance over last week of 15 shillings. Exports so far this month aggregate 11,276 tons.

**Pig Lead.**—The market is quiet and uninteresting. Prices are unchanged, the American Smelting & Refining Company quoting on a basis of 4.20¢. for "shipment" Desilverized in 50-ton lots. Strictly spot Lead in small quantities is quoted here 4.20¢. to 4.30¢., while St. Louis telegraphs 4.10¢. to 4.15¢. The London market has advanced a shade, to £11 7s. 6d.

**Spelter.**—The market is quieter, although no changes in prices are noted. Spot is quoted here to-day 5.10¢. to 5.20¢., and St. Louis is still quoting 4.95¢. to 5¢. London is unchanged at £22 10s.

**Antimony.**—Demand is light, and the market is easier. Cookson's and Hallett's are quoted at 7¢. and other grades at 6¢.

**Nickel.**—The usual amount of business is passing and prices are steady, large lots being quoted at 40¢. to 45¢. and smaller quantities at 50¢. to 60¢.

**Quicksilver.**—The market has declined. Flasks of 76½ lbs. were quoted to-day at \$40. London is unchanged at £7 15s.

**Tin Plate.**—Nothing new has developed in the situation as regards Tin Plate. The market is still quiet and unchanged. The American Sheet & Tin Plate Company is quoting \$3.30 per box, Pittsburgh, for 14 x 20 100-lb. Coke Plates, making the price \$3.49, delivered in New York. The Welsh market has advanced 1½ pence, to 11 shillings 7½ pence.

A revised price-list for Sheet Zinc has just been issued by the Matthiessen & Hegeler Zinc Company, La Salle, Ill. The new base price is \$6.20 per 100 lbs., for Sheet Zinc in 600-lb. casks, f.o.b. La Salle.

## New York.

NEW YORK, September 21, 1904.

**Pig Iron.**—During the week one of the foundries in this district purchased 3000 tons, partly Southern Iron, and some tonnage has also been placed by a large pump manufacturing interest. Quite a considerable business has been done lately in New England, where Buffalo furnaces have been able through water rates to reach buyers at figures considerably lower than those of the Lehigh Valley and Schuylkill Valley makers. The latter have been at a disadvantage, too, at interior points, where the Buffalo furnaces could make low through rail rates. Some competition has also been met from Western Pennsylvania makers. We continue to quote \$14.75 to \$15 for No. 1 Foundry, \$14 to \$14.50 for No. 2 Foundry and \$12.75 to \$13.25 for Gray Forge, tidewater delivery. Tennessee and Alabama brands are \$13 to \$13.50 for No. 2 Foundry and \$12.50 to \$12.75 for No. 3 Foundry.

**Steel Rails.**—There is no truth in the report current in the press last week that the Harriman system had purchased 100,000 tons of Steel Rails. The Harriman order was placed many months ago.

**Cast Iron Pipe.**—An Eastern foundry has secured the contract for 630 tons of Pipe for the high pressure service at Coney Island, which is the beginning of the great undertaking of this character for New York City. Other contracts placed during the week were of no special moment, and at the present time no large lettings are in sight. Trade is running along smoothly, however, the founders being quite busy for the time of the year, and a fairly active trade being in progress in small lots. Carload lots of Cast Iron Pipe are quoted at \$25 to \$25.50 per gross ton for 6 to 10 inch, and \$24 to \$25 for 12-inch, at tidewater.

**Finished Iron and Steel.**—The reduction in Structural Material and in Plates announced the past week was not so great as had been expected. Instead of a cut of \$5 or \$6 per ton as anticipated, the reduction was but \$4, except on Plates 24 inches and narrower on which it was \$6. Possibly it is too early to feel the effect of the reduced prices, but sellers report trade even more quiet than previously. The railroad companies are evidently not disposed to change their policy of economy, and inquiries from that direction for bridges or other work into which Structural Material and Plates enter are decidedly light. Other branches of the Finished Iron and Steel trades are also quiet, but it is expected that the regular meeting of the Eastern Bar iron manufacturers, which will be held in this city next Thursday, may take action, which will have some important effect. We quote, at tidewater, as follows: Beams, Channels, Angles and Zees, 1.54½¢. to 1.80¢.; Tees, 1.50½¢. to 1.80¢.; Bulb, Angles and Deck Beams, 1.64½¢. to 1.85¢.; Sheared Plates, in carload lots, 1.54½¢. to 1.65¢. for Tank, 1.64½¢. to 1.80¢. for Flange, 1.74½¢. to 1.90¢. for Marine, and 1.74½¢. to 2.50¢. for Fire Box, according to specifications; Refined Bar Iron, 1.44½¢. to 1.49½¢.; Soft Steel Bars, 1.44½¢. to 1.49½¢.

**Old Material.**—Business is very quiet, but offerings are not specially heavy. Dealers are looking for a better trade shortly, as consumers have been out of the market so long a time that it is believed they must soon begin to replenish their stocks. Quotations per gross ton in New York and vicinity are approximately as follows:

Old Iron Rails.....	\$14.00 to \$15.00
Old Steel Rails, long lengths.....	11.50 to 12.50
Old Steel Rails, short pieces.....	11.00 to 11.50
Relaying Rails.....	16.00 to 17.00
Old Car Wheels.....	10.50 to 11.00
Old Iron Car Axles.....	15.50 to 16.00
Old Steel Car Axles.....	14.00 to 14.50
Heavy Melting Steel Scrap.....	11.00 to 11.50
No. 1 Railroad Wrought Scrap.....	12.50 to 13.00
Iron Track Scrap.....	11.00 to 11.50
Wrought Pipe.....	7.00 to 7.50
Ordinary Light Iron.....	4.50 to 5.00
Cast Borings.....	4.00 to 4.50
Wrought Turnings.....	6.00 to 6.50
No. 1 Machinery Cast.....	10.00 to 10.50
Stove Plate.....	8.00 to 8.50



### Iron and Industrial Stocks.

NEW YORK, September 21, 1904.

The upward movement in the stock market which has been in progress for such a long time apparently culminated last week, when the highest prices on a number of stocks were reached Friday and Saturday. Since then quite a recession has occurred and most of the active stocks show a decline of \$1 to \$2 per share. The following quotations show the range of prices for the week up to Tuesday evening on the most active stocks: Can preferred 46½ to 48¾; Car Foundry common 22¼ to 23¾; Locomotive common 25½ to 28; Colorado Fuel 32½ to 39¼; Pressed Steel common 32 to 34¾; Republic preferred 42½ to 44¼; Tennessee Coal 45¼ to 49; Steel common 16 to 18½, preferred 65½ to 69½, new 5's 80½ to 82. Last quotations on active stocks up to 1.30 p.m. to-day were as follows: Can preferred 46, ex-dividend; Car & Foundry common 22¼, preferred 81; Locomotive common 26, preferred 96; Colorado Fuel 33¾; Pressed Steel common 32, preferred 78½; Railway Spring common 22¼, preferred 80; Republic common 8½, preferred 43½; Sloss-Sheffield common 39½, preferred 90; Tennessee Coal 46¼; United States Steel common 16¾, preferred 67½, new 5's 80¾.

The annual report of the New Haven Iron & Steel Company shows gross sales of \$369,112, a net profit of \$3222, a net credit to surplus account of \$1682. The balance sheet shows the following, as of August 31:

Assets.	
Plant and improvements.....	\$369,083
Materials on hand.....	106,065
Cash on hand.....	9,303
Organization and charter.....	8,969
Accounts receivable.....	45,420
Bills receivable.....	8,729
Stocks and bonds.....	48,826
Total.....	\$596,397
Liabilities.	
Capital stock.....	\$500,000
Accounts payable.....	10,545
Surplus.....	85,851
Total.....	\$596,397

**Dividends.**—International Steam Pump Company has declared a quarterly dividend of ½ per cent. on the common stock, payable October 1, and the regular quarterly dividend of 1½ per cent. on the preferred stock, payable November 1.

Sloss-Sheffield Iron & Steel Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock.

American Locomotive Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 21.

American Smelting & Refining Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 11, and a dividend of 1¼ per cent. on the common stock, payable October 25.

The People's Natural Gas & Pipeage Company of Pittsburgh has declared the regular quarterly dividend of 2 per cent., payable October 20.

The strike of the cotton mill operatives at Fall River, Mass., is a boon to manufacturers of improved cotton mill machinery, for the mill owners are taking advantage of the idleness of their plants to install much new machinery, with a view to reducing their payrolls. The improvement in cotton machinery has been very rapid, especially in its increased speed of production and in its automatic details, by which an operative is able to handle a greater number of machines. The Fall River mills are installing machinery with this idea in mind, probably because of the ever increasing competition of Southern mills, and also because of the always threatening labor troubles. The result is estimated as meaning the permanent dismissal of some 1500 employees, men and women, as the direct result of the strike. Textile machinery is cheaper than it was; in fact, it is pretty near bed rock prices, the cotton manufacturers state, and this opportunity came along at the right time to afford a solace to the manufacturers, who were compelled to close their great mills because of the refusal of the employees to accept a reduction in wages, which, from the viewpoint of the manufacturers, the situation made imperative.

The Marcus Ruthenburg Reduction Company has been incorporated to do business at Niagara Falls. The capital stock of the company is \$20,000, but it will begin business with \$10,000. The stock is divided into 200 shares of \$100 each, the stockholders and the number of shares they hold being as follows: Marcus C. Ruthenburg, 35

shares; James W. Warner of Oneida, 25 shares; William K. Pierce, Syracuse, 25 shares; William A. Hinds, Kenwood, N. Y., 10 shares; J. Frank Smith, Lockport, 5 shares. The directors are: Marcus M. Ruthenburg, Lockport; James W. Warner of Oneida, and J. Frank Smith of Lockport.

**Crucible Steel Company of America.**—PITTSBURGH, PA., September 21, 1904.—The directors of the Crucible Steel Company of America held a meeting in the Frick Building, Pittsburgh, on Tuesday, September 20, at which a statement was presented giving details of the sale of the Clairton Steel Company plant to the United States Steel Corporation. It is understood that the statement shows an actual loss to the Crucible Steel Company on the sale of the Clairton plant of nearly \$4,000,000. The directors of the Crucible Steel Company have decided to ask the stockholders to authorize a bond issue of \$6,000,000, about \$4,000,000 of which will be necessary to pay off the floating indebtedness, and the balance will be used as working capital. It is said that the Crucible Steel Company, in spite of the dull condition in the iron trade for the past year, will show a profit for every month during the year, and that the net profits for the year will be about \$1,350,000. The statement concerning the sale of the Clairton plant is expected to be sent out to the stockholders on Friday, September 23. The annual meeting of the stockholders of the Crucible Steel Company will be held on October 16, in Jersey City, N. J., for the purpose of electing five directors to take the places of those whose terms expire.

The State banking department of Pennsylvania has issued a circular reminding the trust companies of that State that under the laws of Pennsylvania they are not permitted to do a general banking business or to discount paper. This action is said to be a serious matter, especially in Pittsburgh, where a great deal of the general banking business of the city is done through trust companies. The very general existence of this class of banking institution is of recent origin. In all parts of the country the trust company is replacing the national bank, in many instances absorbing it. The general reason for this is the restrictions of the national bank charter, which strictly defines the functions of the institution, while the trust company can greatly extend its scope of action in financial matters. In some States, perhaps in most States, a trust company must come in under State laws, which provide for adequate surplus and the other safeguards without which the public may be the sufferer. But in some States trust companies amount to little more than private banking institutions, which can never be considered as safe as the national bank or the State bank, over which commissioners exercise strict and constant and generally arbitrary control. In some States the name trust company is attached to enterprises which are not founded upon substantial financial foundations. In the Pennsylvania instance no stigma is cast upon the trust companies, the action of the State authorities apparently being rather to compel them to come in under charters which permit a general banking business. But there are sections of the country where the word trust company would be very misleading to the resident of New York or Boston.

The American Shipbuilding Company, Cleveland, Ohio, has secured the contract for another large steamer. The boat will be built for W. H. Becker of Cleveland. It will be 400 feet over all, 380 feet keel, 50 feet beam and 28 feet deep. The engines of the "G. W. Roby" will be installed in the new boat. It will have two Scotch boilers, 12 x 12 feet. The steamer will cost \$235,000.

The immigration during the last fiscal year ending June 30 numbered 812,870 persons in 1903-1904, 857,046 in 1902-1903 and 648,743 in 1901-1902.

The Allegheny Steel & Iron Company of Pittsburgh, manufacturer of fine sheet steel, is adding a 72-inch plate mill to its plant at Averne, Pa.

## PERSONAL.

Augustus C. Hone, Louisville, Ky., formerly general manager of the Louisville & Atlantic Railroad, has become a member of the firm of Davis, Kelly & Co., iron, steel and tinplate dealers, at Louisville. Mr. Hone will have charge of the machinery department of this company.

F. T. F. Lovejoy, formerly secretary of the Carnegie Steel Company, who has been quite ill at Colorado Springs, Colo., is rapidly recovering and expects to return to Pittsburgh in a short time.

Silas W. Eccles has been elected second vice-president of the American Smelting & Refining Company, in charge of the traffic department. This office is newly created. Mr. Eccles has been traffic manager of the company for some years.

Dr. Henry M. Howe, professor of metallurgy at Columbia University, New York, has returned after a year's absence abroad.

C. M. Schwab of New York has gone to California. He is expected to return during the first week in October.

## Trade Publications.

**Recording Gauges.**—Catalogue No. 13, recently issued by the Bristol Company of Waterbury, Conn., concerns recording pressure and vacuum gauges. It is about 9½ x 12 inches in size and contains 20 pages. Descriptions are given of recording pressure gauges having total ranges of 6 pounds per square inch and over; also recording pressure gauges for extremely low ranges of pressure, combinations of vacuum and pressure and straight vacuum gauges. Illustrations are given of the exterior appearance of each style and also with the cover removed. Another gauge shown is of circular form, differing from the standard line, which is pear shaped, the pointed end accommodating the indicator mechanism. In the round form the mechanism is all contained within the circular case. It has been designed to meet the demand for a lower priced gauge than the standard form and is fully guaranteed for accuracy and reliability. A *fac-simile* of full size chart is shown illustrating a typical form of record. A table with code words and catalogue numbers lists the full line of gauges for various working ranges and length of time elapsed in the taking of a record. Specimen sections of standard charts identify the complete line, giving the numbers by which they may be ordered. A few specialties are shown in the back of the book, including a vertical file chart cabinet, a carrying case for recording pressure gauges, a protecting case for mounting the gauges where they are in danger from dust or injurious atmosphere, and recording instrument ink.

**Tools.**—The Gisholt Machine Tool Company of Madison, Wis., has recently begun a systematic issue of a loose-leaf bulletin, the purpose being to keep the outstanding catalogues up to date by the frequent addition of new pages. Pages 1 to 10 have been sent out with the cover. These show a double boring mill geared to a motor, a universal tool grinder, turret lathes, and several cuts illustrating the operation of grinding a tool and a tool grinder.

**Pipe Threading and Cutting Off Machinery.**—Bulletins 14 to 21 have been received from the Merrell Mfg. Company of Toledo, Ohio. Nos. 14, 15 and 16 give views from the operating and rear side of Apex Nos. 1, 2, 3, 4, 5 and 6 nipple and pipe mill machines, with descriptions of each and price-lists of the parts. The No. 1 machine has a capacity of ¼ to 2 inches, inclusive; No. 2, 1 to 4 inches; No. 3, 1 to 6 inches; No. 4, 2½ to 8 inches; No. 5, 2½ to 10 inches, and No. 6, 4 to 12 inches. Bulletin No. 17 shows motor driven and engine driven pipe threading and cutting off machines, including sizes 5½ to 11½. Portable hand machines Nos. 5, 6, 9 and 11 are covered in bulletin No. 18, these having a capacity of 1 to 4, 1 to 6, 2½ to 8 and 4 to 12 inches, respectively. Combined hand and power machines are shown in bulletins Nos. 19 and 20, the first giving the sizes 5½ to 6½, with capacities of 1 to 4 and 1 to 6 inches, respectively, and the other sizes 9½ and 11½, with capacities of 2½ to 8 and 4 to 12 inches, respectively. Bulletin No. 21 shows power pipe threading machines Nos. 8 and 12, arranged for belt drive. No. 8 has a capacity of 1 to 6 inches and No. 12 a capacity of 2½ to 8 inches.

**Gas Engines.**—The Wellman-Seaver-Morgan Company of Cleveland, Ohio, has issued an attractive booklet of the Cockerill gas engine, illustrating it in the driving of a blast furnace blowing engine, to which service the engine is specially adapted, as well as for heavy duty electric light and power transmission. The engine has been on the European market for some time, and this company has the American rights. The pamphlet only aims to cover its construction and operation in a general way calculated to bring out the more important characteristics. The valve gear, which is one of the most distinctive features, is shown in section. These engines have been built in units of from 200 to 3000 horse-power, and engines with a total of nearly 80,000 horse-power are now in operation. A list is given of these engines, the purposes to which they are put and the location of their installation.

**Cutting Off Machines.**—The Wagner cold saw cutting off machines, manufactured by the Diamond Drill & Machine Company of Birdsboro, Pa., are illustrated in their many sizes and forms in catalogue No. 25, which is now being distributed. There are four styles, universal, bar, I beam and steel casting types, each being made in seven sizes. Among the advantages to which attention is directed is the great capacity for speed, minimum wear of the saw blade, automatic feed varying with the shape and hardness of the material being cut, automatic indication of dull saws, uninterrupted cutting even with saws having broken teeth and every tooth brought into action by means of counterbalanced feed. An automatic saw sharpener is also illustrated, which is built in two sizes. The first will handle saws from 10 to 26 inches in diameter and the second saws from 18 to 40 inches in diameter.

**Bolt and Nut Machinery.**—The National Machinery Company of Tiffin, Ohio, has lately issued a new catalogue of bolt and nut machinery, forging and bending machines, wire nail, spike and special machinery, superseding catalogue A. It is an 8 x 10 inch book of 170 pages attractively illustrated and neatly arranged. The left-hand pages are reserved for illustrations, while the right-hand pages contain descriptive matter pertaining to the associated cuts. The descriptions are comprehensive, treating the machines first as a whole and then in detail with respect to the several parts. Frequent tables of specifications are included. Where line cuts and sections facilitate an understanding of some special feature they are used. Numerous tables of value to the trade addressed are added, and the usefulness of the book for purposes of reference is enhanced by an appended classified index.

## NOTES.

The Chicago House Wrecking Company, Thirty-fifth and Iron streets, Chicago, has just issued a 250-page catalogue devoted to iron and steel goods, hardware, plumbing, roofing, tools, machinists' supplies, vehicles, lamps, telephones, and, in short, a miscellaneous assortment of goods such as would be carried in a large department store. The materials in this catalogue are new, as the firm issues separate lists covering the large business which it does in second-hand materials.

The Morse Twist Drill & Machine Company of New Bedford, Mass., are now issuing two series of circulars. English and Spanish, for use in connection with their export trade, which contains information that should be of value to the exporters and foreign dealers. Circular No. 1 was issued under date of July 1, and the next issue is expected to be out October 1. The circulars are prepared for the company by W. H. Frothingham of New York, now and for many years connected with the export trade. They contain a useful condensed table of approximate metric equivalents.

The Scully Steel & Iron Company of Chicago, Ill., has lately issued a quarterly stock book with over 140 pages, listing sheet steel boiler and tank heads, tube and rivet braces, flanges, stay bolts, taps, machine bolts, bars, sheet copper, structural forms, tube expanders and cleaners, wrenches and all forms of blacksmith and boiler makers' tools, forges and blowers, handles, vises, chain blocks, twist drills, ratchets, bending machines, shears and punches, hammers, riveters, pneumatic tools, &c.

**The Platt Iron Works Company.**—The plant and business of the Stilwell-Bierce & Smith-Vaile Company, Dayton, Ohio, which has been in the hands of trustees since last January, have been sold to Col. J. D. Platt, president of the Barney & Smith Mfg. Company, of that city. The purchase price was in the neighborhood of \$750,000. The Platt Iron Works Company has been incorporated under the laws of Ohio with a capital stock of \$1,000,000 to carry on the enterprise, and on October 1 the new company will assume control, taking over all the unfinished contracts of the new company, will start out with a cash working capital of about \$400,000, and will make many improvements to the plant, which is already one of the largest producers of pumps, water turbines, feedwater heaters and cotton seed oil machinery in the Middle West. A considerable export trade has been conducted for several years, especially with South America, and the new interests are preparing to enter the foreign trade on a still larger scale. The personnel of the engineering and sales departments will remain practically unchanged, and George W. Neff will continue as Eastern manager, with headquarters at 93 Liberty street, New York.

The National Malleable Castings Company, Sharon, Pa., has secured a contract from the New York & New Jersey Railroad Company for about 3000 tons of steel castings for the interior fittings of its tunnel under the North River, which is nearing completion.

At the annual meeting of the stockholders of the Virginia Iron, Coal & Coke Company, the retiring Board of Directors was re-elected. The new board, on organizing, re-elected the retiring officers.



# HARDWARE.

THE announcement of the recent accessions to the membership of the NATIONAL HARDWARE ASSOCIATION are certainly indicative of the vitality of this great organization. It will be seen that prominent houses near the northern border, a half dozen from the great and rapidly developing State of Texas, others from New England and the interior, as well as a leading house in St. Louis, which thus occupies a central position, are among the additions to the association's already thoroughly representative list of wholesale Hardware merchants. Apart from what it has accomplished directly in its own interest it has had a wider influence, and by its example and otherwise had much to do with the formation of other trade organizations, as the manufacturers and retail merchants, for example, have been stimulated to form associations of their own to accomplish in something the same spirit, and in some cases by similar methods, the things which are regarded as contributing to their own protection and advancing their own interests. The success of the Jobbers' Association is thus in good measure to be credited with the establishment of other associations constituted for their own ends. All this is unquestionably for the interest of the trade as a whole, and probably for each of the three great classes into which the trade is divided, for, while there is sometimes a clashing of interests, as each association in a certain sense has to take care of itself as against the others, on the whole the market has gained from such organization and contact. This is the case not only because something has been accomplished in determining, or at least asserting, the relations between the various classes, a matter, however, in which the interests of the individual and the laws of trade have more to do than associations sometimes recognize, but in addition to this the trade has gained from the attention given to correct business methods and the cultivation of alertness and even aggressiveness in the assertion and promotion of the interests which are supposed to be safeguarded and advanced by the various organizations. In all this the National Hardware Association has had an influential part, and its continued activity and usefulness will be regarded with satisfaction by all who take a broad view of trade questions.

There are indications cropping out here and there that the catalogue house agitation may have results involving changes in trade which were not at first anticipated. While the question is one which has caused manufacturers a good deal of concern, in view of the possibility of the serious opposition of both jobbers and retailers to goods handled by catalogue houses, it is significant that the course of things under the surface is in the direction of changes which, if they should take place, would alter, if not revolutionize, existing methods of distribution. For one reason or another several manufacturers are thinking of making prices which will be regulated strictly by quantity, with only such moderate differentials for various quantities as may be necessary. This would give enterprising retail houses who handle fair amounts of goods an opportunity to purchase on materially better terms than at present. Others, indeed, are thinking what the effect would be of making substantially one price to all buyers, thus giving retail houses the same privileges in purchasing as their great competitors at present enjoy.

Another complication in the problem which has not been given the attention it deserves is the ability of the catalogue houses to control the manufacture of many kinds of goods, including much Shelf and Staple Hardware, either operating their own factory, or, what is practically the same, taking the entire production of factories which are in some kind of close alliance with them. Those familiar with things below the surface of the trade are aware that in several lines the catalogue houses are practically their own manufacturers, and there is a marked, even if unobtrusive, tendency in this direction. Whatever the jobbers and retailers may think in regard to the matter, the manufacturers cannot be supposed to look with indifference on this tendency, and some of them make the point that there may be disadvantages to all classes in the trade if the obtaining of goods by the catalogue houses is made so difficult that such houses will be driven in self defense to supply their own requirements.

These considerations, which fortunately relate to possibilities rather than actualities, must be borne in mind by those who are studying the question in all its bearings. They have a special significance for the jobbing trade, who would be the principal sufferers if the existing channels of distribution were broken down. The trade, however, is to be congratulated that the committee which has this matter in charge for the organized merchants of the country, both wholesale and retail, is representative not only of the progressiveness and even the aggressiveness of the trade, but also of its ability and conservatism, so that it may be trusted to proceed in this matter with due care, even with caution, and with the proper regard for the interests of the manufacturers, as well as of the distributors.

## Condition of Trade.

Notwithstanding somewhat different conditions in various lines of goods and in various sections of the country, it may safely be said that business is increasing in volume. The progress of the season has naturally something to do with this, as fall and winter goods are coming into request, and with the approach of cold weather general trade activities are stimulated. Questions about prices have something to do with limiting the volume to the actual early requirements of purchasers, and a good deal of caution is being exercised. All classes in the trade recognize the wisdom of this course and are not disposed to complain. There is, however, little reason in this for starving stocks, the proper policy being to keep them up in such a state of completeness as will permit the prompt and businesslike supply of such articles as are called for. This is the disposition shown by retail merchants, as evidenced by the business that both manufacturers and jobbers are doing. A great many orders, however, are for small quantities. The jobbing trade are undoubtedly well supplied with goods, and in some lines more than they desire have accumulated in their warehouses. These they are, however, gradually working off. Competition, as is natural in these conditions, is very active, and prices on many goods are frequently slightly shaded by both manufacturers and jobbers, with a view to securing business. The outlook for the future continues to be regarded hopefully, and the very slight disturbance to trade on account of the approaching election is often commented upon.

### Chicago.

Owing to a blunder on the part of the telegraph company the telegraphic market report from Chicago was

omitted from all except the latter part of last week's edition, which was necessarily placed out of its regular order. Hardware business is showing a gratifying improvement. The month of August with both retailers and jobbers in most cases surpasses and in no case falls below the same month last year, and September business, though fair, is coming in encouragingly. A large business is being done in Wire Nails and other Wire products. The demand for fall goods is all that could be expected and already begins to tax the ability of mills and jobbers to supply. The trade in strictly cold weather goods, such as Skates, Snow Shovels and Sleds, is beginning to come in nicely. Builders' Hardware is exceptionally active in the city, while the size and number of country orders are also increasing. There is much buying of this material from jobbers' and manufacturers' stocks, as the character of the orders does not as a rule permit of mill delays. Orr & Lockett Hardware Company secured a contract for Hardware on the new office building erected by the Case Threshing Machine Company at Racine, Wis., aggregating about \$3000. The contract calls for Corbin Unit Locks.

### NOTES ON PRICES.

**Wire Nails.**—The volume of business which has been booked since prices were reduced is already causing some delay in making prompt shipments for the Western trade from the mills of the largest producer. The market has shown no additional weakness, and prices are fairly well maintained, except at competing points, where irregularities occur, sometimes disguised in freight charges. The tendency still continues to do away with arbitrary differentials between the jobbing and retail trade, the carload price being accessible to carload buyers of either class. The most prominent manufacturers are not accepting orders for delivery in advance of 30 days. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carload lots .....	\$1.00
Less than carload lots.....	1.05

**New York.**—There has been a gradual improvement in demand since the first of the month from retailers in this city and from those in territory tributary to this point, until it is now quite large. Orders are for larger quantities, many of the merchants who have been buying in small lots now ordering by the carload. The market is firm. New York quotations are as follows: Single carloads, \$1.79½; small lots from store, \$1.85 to \$1.90.

**Chicago, by Telegraph.**—The leading producer is besieged with letters, telegrams and telephone messages urging prompter shipment of orders, but is compelled to reply to most such messages that the large volume of business booked since the reduction in prices makes delay in shipment inevitable. Prices of the leading producer are: In carload lots to jobbers, \$1.75; to retailers, \$1.80; less than car lots, \$2 per keg, Chicago. From these prices a confidential rebate is given to jobbers to permit them to compete with a large independent who gives the above prices direct to the retailer or consumer in car lots.

**Cut Nails.**—The recognition by the manufacturers of ruling prices has not resulted in any large increase in demand. The natural requirements of the trade throughout the country for fall consumption of Nails is always expected to stimulate buying to a greater or less extent at this season. Association quotations are as follows: \$1.00 and \$1.65 for carload lots and less than carload lots, respectively, f.o.b. Pittsburgh. These quotations in a general way represent the market, but in some cases these prices can be shaded to large buyers about 5 cents. In the East Iron Nails are still quoted at the same price as Steel Nails, but in territory west of Pittsburgh Iron Nails are quoted in carload lots, f.o.b. Pittsburgh, at \$1.65, with an advance of 10 cents in less than carload lots.

**New York.**—Cut Nails are moving in good volume, demand keeping somewhat in advance of the usual proportion to Wire Nails. The market is firm at the figures announced after the recent change in prices. Quotations

are as follows: Carloads on dock, \$1.74; less than carloads on dock, \$1.79; small lots from store, \$1.85.

**Chicago, by Telegraph.**—An increased demand is felt for roofing sizes of Iron Cut Nails, but aside from this the Cut Nail business is quiet. Prices are based on \$1.60 Pittsburgh, car lots, and \$1.65 for less than car lots, plus full freight to destination, which makes prices here \$1.76½ to \$1.81½, Chicago. The extra 1½ cents, however, is not always insisted upon.

**Barb Wire.**—As the season advances and farmers have the time to repair the old and to build new fences an increase in demand is noticed, and now this is regarded as quite satisfactory. The remunerative prices which have been received for crops indicate that requirements for fencing will be large. The regular schedule of prices is as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.75	\$2.05
Retailers, carload lots.....	1.80	2.10
Retailers, less than carload lots.....	1.90	2.20

**Chicago, by Telegraph.**—Fall trade on Barb Wire is stated to be quite satisfactory to both leading producers and independents, the present demand indicating that an extremely large mileage of fence will be strung this fall by farmers all over the country, who have secured excellent prices for their products. We quote: Jobbers, car lots, Painted Wire, \$1.90; Galvanized, \$2.20; retailers, car lots, Painted, \$1.95; Galvanized, \$2.25; less than car lots, Painted, \$2.05; Galvanized, \$2.35; Staples, \$1.85; Galvanized Staples, \$2.15. The jobbers' prices are named to large retailers by certain independent mills.

**Smooth Fence Wire.**—There is an increase in demand, coming largely from manufacturers of Wire Fencing, who are placing quite liberal orders for immediate shipment. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.45
Retailers, carloads.....	1.50

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	13	14	15	16
Annealed.....Base.	\$0.05	.10	.15	.25	.35	.45	.55	
Galvanized....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15

**Chicago, by Telegraph.**—Evidently makers of Wire Fence have decided that it is useless to longer delay their purchases of Wire and, as a consequence, producers of such Wire are receiving liberal orders for immediate shipment. Prices are unchanged, on the basis of \$1.45, Pittsburgh, which, with the arbitrary 15 differential, makes the Chicago price on Nos. 6 to 9, Annealed, \$1.60; Galvanized, \$1.90, in car lots, with the usual extra for lighter gauges.

**Sheet Zinc.**—Under date of September 13 the manufacturers of Sheet Zinc announce an advance of 10 cents, making the present price \$6.20 per 100 pounds, f.o.b. mill, in 600-pound casks, subject to the usual discounts.

**Paints and Colors.**—Leads.—There continues to be an improved demand for White Lead in Oil for immediate delivery, while in many instances contract deliveries have been increased in anticipation of a large demand during October. Labor troubles are disappearing, and building operations are assuming normal conditions. While quotations of some manufacturers of White Lead in Oil are from 6½ to 7 cents per pound, according to quantity, some brands are obtainable at 6¼ cents and upward, according to quantity and terms of sale.

**Putty.**—Manufacturers of Putty complain that the market is in an unsatisfactory condition, owing to low prices, resulting from keen competition. This is most prominent in commercial bulk Putty, which, it is reported, is being sold at \$1 per hundred pounds, and that in some cases this price is slightly shaded. Other manufacturers are quoting it at \$1.05 per hundred pounds.

**Varnishes.**—Under date of September 6, 1904, the Glidden Varnish Company, Cleveland, Ohio, issued a circular letter to the trade announcing that on and after October 1, 1904, its terms on Jap-a-lac and all Varnishes to the dealers' and jobbers' trade will be 60 days net, or



2 per cent. discount for cash in 10 days from date of invoice. The company is of the opinion that the condition of the market does not justify the continuance of present terms, owing to the steady advance of all raw materials and because it is compelled to purchase the greater part of its supplies on 30 days' time. The pressure to sell Varnishes, particularly the higher grades, upon which, it is understood, profits are large, has resulted in making the terms attractive to the purchasers, as long a time as four to six months having been given in many instances.

**Oils.**—*Linseed Oil.*—Independent crushers of State and Western Oil have taken the initiative and are offering Raw Oil in carload lots at from 39½ to 40 cents per gallon. It is reported that the largest interest is meeting these figures. While some large lots have been sold in the neighborhood of these figures, the inquiries for futures appear to have fallen off, and demand is confined mostly to jobbing lots, the larger buyers presumably having supplied their needs for present requirements. Card prices are as follows: City Raw, in lots of five barrels or more, 45 cents per gallon; in lots of less than five barrels, 46 cents per gallon; State and Western Raw, 43 to 44 cents per gallon, according to quantity. For Boiled Oil there is the usual 2 cents advance per gallon over Raw.

**Spirits Turpentine.**—The gradual decline in prices which has been going on for some time is attributed to September receipts at Southern points being hurried to distributing points, the large supplies in foreign markets with the accompanying lack of demand and light buying by large consumers in this country. Buying in this market is at present confined to jobbing lots, with moderate demand. The market has moved up ¼ cent from last week's figures. Quotations in this city, according to quantity, are as follows: Oil barrels, 55½ to 56 cents; machine made barrels, 56 to 56½ cents per gallon.

**Rope.**—A better demand is noted, though not up to manufacturers' capacity. Trade is not of a character to indicate that merchants are stocking up, but frequent orders show that the current requirements are being met. Prices are apparently steady on the basis of 7-16 inch diameter and larger as follows: Pure Manila, 11½ cents per pound; other grades of Manila, 10¼ to 11 cents, according to quality; pure Sisal, 9 cents; mixed Sisal, 7½ cents.

**Glass.**—Local jobbers have made the discount of 90 and 5 per cent. apply to the first two brackets, instead of to the first three brackets. For larger sizes the price remains unchanged at 90 and 15 per cent. discount, all from the jobbers list of October 1, 1903. Demand continues light, and improved conditions in this respect are not looked for, to any extent, for the balance of the year. Regarding wages for the coming fire, manufacturers are asking a 10 per cent. reduction, and the workers an advance over last year's scale. Present indications point to a compromise being effected. A failure to come to an agreement would probably result in private scales being agreed upon by individual factories, as was the case in many instances last fire, which would be liable to lead to a disorganized market again. At present there seems to be some likelihood of the Jobbers' Association being revived, including both those of the East and the West.

### NATIONAL HARDWARE ASSOCIATION.

**A**S stated in an article in regard to the National Hardware Association, which appeared in only a part of our last issue, while a few members have resigned for various causes during the past five or six years, the membership has been kept up to the standard by other accessions. Since the last annual convention, however, nearly all of those have returned. The following houses have affiliated with the association since the last meeting, in November, 1903:

Bronson & Townsend Company, New Haven, Conn.  
Norvell-Shapleigh Hardware Company, St. Louis, Mo.  
Fletcher Hardware Company, Detroit, Mich.  
Marshall-Wells Hardware Company, Duluth, Minn.  
Trenan, King & Co., Ithaca, N. Y.  
Kruse Hardware Company, Cincinnati, Ohio.

Benedict, Warren & Davidson, Memphis, Tenn.  
Wm. Henry & R. E. Bell Hardware Company, Ft. Worth, Texas.  
Bering & Cortes Hardware Company, Houston, Texas.  
Ed. A. Hughes & Co., Abilene, Texas.  
Nash Hardware Company, Ft. Worth, Texas.  
Peden Iron & Steel Company, Houston, Texas.

It is regarded as not unlikely that before the next meeting two or three other very prominent concerns will be enrolled as members.

### A. C. RULOFSON.

**A.** C. RULOFSON, who for many years has been connected with Baker & Hamilton, San Francisco, has severed his connection with that corporation, his own personal affairs demanding his entire attention. Mr. Rulofson is one of the best known Hardwaremen on the coast. His business career dates from 1868 as an employee of the Russell & Erwin Mfg. Company's branch house at San Francisco. After three years' apprenticeship the Russell & Erwin Company sold out to the Huntington-Hopkins Company, which opened at San Francisco a branch of their Sacramento house. At the same time Baker & Hamilton, who had previously had an office in San Francisco, with headquarters at Sacramento, concluded to go into the Hardware business at San Francisco. They employed a number of the salesmen and clerks of the Russell & Erwin Mfg. Company. Mr. Rulofson accepted the modest position of order boy. His advancement was gradual, and step by step, from the position of traveling salesman and head salesman in the store, until finally in 1882 he was promoted to the management of the buying and sales department, which position he has held since.

Mr. Rulofson has always been an ardent association man, having been on the Executive Committee of the Pacific Coast Hardware & Metal Association, and in 1903 was unanimously elected president of the association, which office he held for one term, declining re-election. At the present time he is a member of the Advisory Board. Mr. Rulofson took much interest in the many retail Hardware dealers' organizations on the coast. During his many years of faithful service he has made numberless friends, who hope that his retirement from active participation in the wholesale jobbing business is only temporary. Mr. Rulofson has not yet definitely outlined his future plans.

### DEATH OF P. H. LEONARD.

**M**ANY will learn with regret of the death of P. H. Leonard, which occurred yesterday (Wednesday) morning at his home in Hackensack, N. J. For many years Mr. Leonard was a leading merchant in the China and Crochery line, and held a prominent place among the merchants of this city, being actively identified with various commercial and financial interests. He was a member of the Chamber of Commerce, a director of the Germania Fire Insurance Company and of the Emigrants' Savings Bank, a member of the Catholic and Colonial clubs, and also of the Hardware Club, in the organization of which he was active. His ability and personal qualities made him many friends, who, notwithstanding his retirement several years ago, hold him in kindly remembrance.

**THE PENN SHOVEL COMPANY**, Warren, Ohio, announces that Isaac Krewson has been appointed general superintendent of the factory. Mr. Krewson was for many years superintendent of T. Rowland's factory, at Cheltenham, Pa., and thus brings with him a thorough knowledge of the Shovel business. Up to the present time the company has not made Back Strap Shovels, but machinery for the manufacture of this line will soon be installed, and the company expects to be able to supply these goods in about 90 days.

**THE STOVER MFG. COMPANY**, Freeport, Ill., has appealed from the recent decision of Judge Kohlsaat of the United States Circuit Court in the suit brought against the Arcade Mfg. Company, also of Freeport, for infringement on the Stover Company's Stewart Mop, carrying the case to the United States Circuit Court of Appeals.

## Letters from the Trade.

*Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.*

### A BUYER'S PROTEST.

*From a Western Merchant:* Since the formation of the so-called trusts, or combinations of several factories of a kind, we fancy that most buyers like ourselves have been at times annoyed by the demand made by certain constituent companies that remittance and check should be made out to some holding company entirely different in name from the one rendering the bill. In other words, if we get a bill from the "Red Iron Rolling Mill" made out in due form, we believe that we should be permitted to remit to these people who render us the bill and not to some trust company in an entirely different place and of an entirely different name. There is nothing to show on our voucher that a check made payable to this holding company discharges the obligation of the original shipper. In other words, it involves extra labor on our part to keep the account straight.

What more simple than to make the check payable to the original billing company and let them indorse over to their holding company, trust company or whatever agent or corporation they choose to confide their financing to? We had one case lately where the shipper insisted on the check being mailed to him direct at once, although the invoice was in the holding company's name. This we declined to do, and in a few days learned that the very urgent gentleman had made an assignment. Anyhow, we do not believe that the customers should be obliged to keep track of the internal bookkeeping arrangements of these combinations. That ought to be part of their own domestic machinery. We think all buyers should protest against the nuisance of paying in any other way than to those who render the bill.

WESTERN BUYER.

### PRICE CARDS IN THE WINDOW.

*From a New England Merchant:* I have read your paper faithfully and with much interest for a number of years. I have become more and more interested in it of late, since the Catalogue House Question and the subject of Window Advertising, with price cards, have taken prominence. I have said to myself time and again, "I wish some of these people could put themselves in my place for a while." In each issue more and more seem to favor the price card in the window business, until I've got to say a few words in the matter myself.

Say, did any of you fellows who favor price cards in the window ever keep a country Hardware store in a little town of 3000 inhabitants—a town where Jim Smith, before he shingles his barn, finds out how much each man who has shingled in the past year paid for his Shingle Nails, and where he bought them, and where the above mentioned Jim will hitch up the gray mare and drive 10 miles if he hears he can buy his 100 pounds of Shingle Nails  $\frac{1}{4}$  cent per pound cheaper than the regular price at home? If you haven't tried a town like this, you've got a lot yet to learn about price cards.

One of my competitors (and we are great friends) goes past my store several times a day to and from his home. If I've got a Maydole 11½ Hammer in my window with a card attached, saying "The best Hammer made for 50 cents," he sees it, and what does he do? Tells his hired man to make a price of 48 cents on the same Hammer, but not to sell any if he can avoid it. That afternoon the same Jim Smith spoken of before comes to town, with his family, to buy a few things and, incidentally, to spend the afternoon looking the town over. Jim wants his Shingle Nails, a Hammer to drive them with, some Barn Door Hangers and a few other items of Hardware. He sees the Hammer, with price card attached, and says, "That looks like a good one; guess I'll get it before I go home." "Won't

### Jim Smith's Visit

you take it now? There is no better and the price is low," I say. "No. Mandy's got my pocketbook. Guess I'll wait till she comes back along," is the reply. Jim strolls about the store for a while and sees and examines very carefully all the articles he thinks of buying, then walks out saying, "Guess I'll go and find Mandy" (his wife).

He calls into Brown's—my competitor—and looks the ground over, and after a while asks the clerk if he's "got any of them Mr. Maydole's Hammers." "Oh, yes, certainly," and the clerk is "on" at once, because he is aware that Jim doesn't know a Maydole

### How Brown Works It

from any other Hammer. "What size did you say, Jim?" "'Bout a 11½, I guess." That settles it with the clerk; he knows he is just from my store, so he shows him the Hammer he asks for. Jim looks at it very critically for a while and from all points. "What der yer charge for it?" "Forty-eight cents, Jim, for that one; it's a high toned one, but" (as he passes out a cheap Hammer with a 33 1-3 per cent. profit on it) "here is one that's a bargain at 42 cents; not quite so stylish, perhaps." That does the business with Jim Smith. He buys the cheap Hammer, that I sell for 35 cents, of Brown's clerk, after a little dickering, for 40 cents, then buys the other Hardware he wants at the same place, and goes home with his family perfectly satisfied, and wonders how Brown can sell Hardware so much cheaper than I do.

I will add one other instance of price cards in the window. I have many customers who are Wagon makers in a small way, and for that reason sell a great many Tire Bolts for a small country store. The prevailing discount from jobbers—at the time of which I speak—was 75 per cent., and the retail price was, and had been for a long time, 20 cents per 100 for

### A Plunge in Tire Bolts

1¼ x 3-16 size. One day a party who seemed to want to sell me something pretty badly offered me a discount of 80 per cent. if I'd take a good quantity. We settled on two cases, and I knew I had a bargain. When they came I told my man to put about 200 boxes in the window with a price card at 17 cents. The first day they went a flying, the second day fairly well, and then they slowed down, and we couldn't sell any.

After about a week I tumbled to the cause. My competitor had bought some of the same man at same price, had put a lot in his window without a price card, and was selling them at 16 cents. He acknowledged to me—as I said before, we are very friendly—that if I hadn't put the price card in the window he should have sold them at the old price of 20 cents, as he knew he could get no more at a discount of 80 per cent. So Brown sold Tire Bolts, and with them much other Hardware, that would have been sold by me but for my price card in the window.

The United States covers a lot of territory, and some places in it are quite a distance apart, so I presume what applies to one town may not apply to another, but I cannot argue the idea out of my head that while price cards in the window may be satisfactory in cities, they work about the same as a mortgage

### Price Cards a Mortgage

on your stock does in a small town. I presume some of the advocates of price cards will say that as the Bolts cost me but 13 cents I should have marked them 15 or 16 cents. But I contend that where a man gets an extra bargain he should have part of the benefit thereof himself, and give a part to his customer, and so help out on the many articles he is obliged to sell at a profit of 10 and even 5 per cent.

"PETE FROM THE COUNTRY."

SEALED PROPOSALS in triplicate will be received at the General Depot of the Quartermaster's Department, Jeffersonville, Ind., until 10 a.m. September 29, for furnishing and delivering large quantities of supplies in the Hardware line, including Stoves and Ranges, Files, Lawn Mowers, Padlocks, Scales, Scythes, Screws, Saws, Coffee Pots, Shears, Chain, Nails and Tacks, Wrenches, Bolts, Wheelbarrows, Hinges, Ash Barrels, &c. Bids must be made on blanks furnished by the department through J. M. Marshall, depot quartermaster.



Arrangement of Stock Ledger.

WE have had inquiries from time to time from merchants for a suitable form of stock ledger, and herewith present several methods of keeping track of

In the form shown in Fig. 2 separate columns are provided for purchases. More space is required by this arrangement, but in some respects it will be found more convenient than the form represented in Fig. 1, as footings of "stock" and "sales" columns can be made at any time and the exact condition of the stock definitely

James Ward															
Plain								Galvanized							
	Jan	8	10	12	14	16	18	20	8	10	12	14	16	18	20
American	4	500	500	1000	1000	500	500	500	200	1000	1000	1000	500	500	—
	4	100		300							300	500			
	5		400		200	200							100		
	6									300					
	8	400		500			300				600				
	10				600			200				300			
American	12	500	500	1000	1000		500	300		1000	1000	1000			
	12			400	700		500								

Fig. 1.

stock on hand which have been found convenient and serviceable in practical use.

In the form, Fig. 1, the amounts encircled represent

known. It is also the better to use if the pages are long, as the advantage to be gained from footings is then of greater value.

James Ward																
Plain										Galvanized						
	Jan	8	10	12	14	16	18	20	8	10	12	14	16	18	20	
American	4	500	100	500	1000	300	1000	500	500	200	1000	1000	300	1000	500	-
	5			400		200	200							100		
	6									300						
	8	400			500		300				600					
	10				600			200				300				
American	12	500	500	1000	1000	700	500	500	300	1000	1000	1000				

Fig. 2.

quantities ordered, the other entries representing sales. With this method it is easy to tell at a glance the amount on hand of any size or number of the goods in question.

Method of a Prominent Jobbing House.

The form which is reproduced in Fig. 3 illustrates the method which is used by a well-known jobbing

		1903			
		JAN 10	JAN 30	FEB 20	MCH 10
NICHOLSON FILES		50			
MILL BASTARDS 6 IN		75	40		
		100			
8		327	300		
		200			
10		412	240		
		100			
12		260	200		
		60			
14		90	50		
		75			
16		75	50		

Fig. 3.

If desired, red ink may be used in entering items ordered, and the circles thus rendered unnecessary. The names of parties from whom the purchases are made are written in the column at the left.

house, whose business system is among the best in the country. The company remarks that it has not found it practical to keep such a record as would permit an inventory to be had at all times covering the exact stock

on hand of each article in the Hardware line. The expense in stationery, clerk hire, &c., would, in its estimation, far outweigh any advantage to be secured by having an exact inventory of every article in stock available at any time. The method which has been adopted by the company, however, gives an approximate stock report, which, when desirable, can be promptly verified and supplemented by reference to the stock itself on any special item. The company's method of using the stock book, a portion of a page of which reduced about one-half is reproduced in Fig. 3, is as follows:

The department stock man has standing instructions to report, say, the stock of Nicholson Files every 20 days; therefore the vertical rulings on the page are headed January 10, January 30, February 20, March 10, and so on. On January 10 the stock man reported on hand 75 dozen Nicholson Mill Bastard Files, 6 inches. Between January 10 and January 30 50 dozen were ordered, as shown by the upper entry, which is in red ink. The stock sheet on January 30 showed on hand 40 dozen, indicating sales of this size between January 10 and 30 of 85 dozen. On the 12-inch size there were on hand January 10 260 dozen. Between January 10 and 30 100 dozen were ordered. On January 30 stock sheet showed 200 dozen on hand, indicating sales of 160 dozen in the period of 20 days. When an inventory of stock is taken, say on January 30, all factory orders between January 30 and February 20 are posted into the stock book in hard pencil; then when the stock sheet comes up on February 20 these accumulated quantities are entered in red ink in the same space and the pencil figures erased.

The space to the left of the items is reserved for factory quotations, freight allowances, datings, cash discounts and other information of that character which is necessary to the buyer and is so important and confidential in its character as to necessitate having the stock book protected by a lock and key.

### REQUESTS FOR CATALOGUES, &c.

*The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses:

FROM J. P. CARPENTER, Waco, Texas, who is again doing business at the old stand, having recovered from the water damage sustained in a recent fire in his neighborhood.

FROM F. W. BREDLOW, Fort Smith, Ark., who has succeeded Conrad Triesch in the Hardware, Stove and Tinware business.

FROM H. SMELSER & SON, Rockville, Neb., who are successors to W. M. Smelser in the Shelf and Heavy Hardware, Stove, Agricultural Implement and Sporting Goods business.

FROM TOLLEFSON & BOHOCH, St. Ansgar, Iowa, who have recently bought out the Hardware, Stove and Furnace business formerly conducted by Colbertson & Tollefson.

FROM CUSHING HARDWARE COMPANY, Cushing, O. T., which is occupying a new brick building, 25 x 120 feet. The company's line includes Shelf and Heavy Hardware, Stoves and Tinware, Farm Implements, Paints and Oils, Sporting Goods, &c.

FROM HALL-MELTON HARDWARE COMPANY, Chattanooga, Tenn., which has increased its capital stock from \$20,000 to \$50,000 for the purpose of opening up new territory, the company conducting both a wholesale and retail business in Shelf and Heavy Hardware, Stoves, Agricultural Implements, Paints, Sporting Goods, &c.

FROM CRESCENT HARDWARE & PLUMBING COMPANY, Pittsburg, Kan., which has lately engaged in business.

FROM F. E. MOSS FENCE COMPANY, 119 North Water street, Mobile, Ala., which about November 1 will open up with a stock of Fencing, Fence Tools and Machines

and Fence supplies, and desires catalogues and quotations pertaining thereto.

FROM THOS. ZIMMERMAN, Odessa, Minn., who has lately taken possession of a new building erected especially for his Hardware, Stove, Agricultural Implement, Paint and Sporting Goods business.

FROM MILLIGAN & ORR, Bellefontaine, Ohio, who have lately opened a new store, in which they will carry Shelf and Heavy Hardware, Stoves, Tinware, Paints, Sporting Goods, &c., at wholesale and retail.

BUTLER BROTHERS, New York, have issued Catalogue No. 511 for the fall of 1904, containing 442 pages, quoting net prices to the retail trade, which are guaranteed during September or until their October catalogue is issued.

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## Special Brands.

THE announcement that the American Hardware Manufacturers' Association will make the subject of special brands a prominent topic at its approaching convention has been regarded with much approval by manufacturers in general. The whole matter, as we have pointed out before, is one of very great importance to the manufacturers, who, so far as they make special brands, are deprived of the reputation which results from high quality in their products. Besides losing in this way one of the great incentives to making good goods, there are other serious disadvantages and drawbacks connected with the practice. Some of these and other aspects of the question are touched upon in the following letters:

### LETTER FROM A MANUFACTURER OF TOOLS.

It is a fact which must be generally admitted that a manufacturer whose business is done under factory brands can be reasonably sure of holding his business from year to year against all reasonable competition, providing he maintains the standard of quality. If, however, his business is done principally under jobbers' special brands, he is at the mercy of the jobbers and his competitors. In our line the special brand feature has gained such a foothold that practically 75 per cent. of the business is done under special brands. This gives the manufacturers practically only 25 per cent., on the average, of business which they can be sure of. The other 75 per cent. of business, which it is necessary for them to secure in order to successfully operate their factories, must be fought for from year to year against any and all kinds of competition. The jobber does not usually advertise to his trade the name of the manufacturer who supplies his special brands, so that he has the advantage of the privilege of changing from one maker to another as he may desire, while his customers and the consumers (who are the final judges as to quality) have no voice in the matter. Although a manufacturer may have made a certain jobber's brand for years, although he may even have originated the particular style of finish or pattern for the jobber, and, as a result of the honest application of his knowledge, experience and skill, worked up a desirable reputation for the brand, he can never be sure that some irresponsible competitor will not come around the next season and cut his price, thereby forcing him to meet the cut or lose the business. If he loses the business, and the quality of the goods which the jobber substitutes turns out badly, the jobber, of course, throws the blame onto the manufacturer, but, we venture to say, that he rarely advises his trade of the true cause—that he has tried to save a little in the cost by transferring his business to a cheaper maker.

### Jobbers Change from One Manufacturer to Another

Without doubt the manufacturers are entirely to blame for allowing this condition to become established. Special brands would never have gained the foothold they have if leading manufacturers had not adopted the insane policy of offering to sell their product under special brands for less money than when put up under their own factory brands. It should have been just the reverse. While it will take time to correct this evil, and while special brands will always be used to a greater or less extent, we trust that the time is not distant when manufacturers will take a united stand for intelligent action toward mitigating this evil as far as possible.

### Usually a Working Down in Price and Quality

Without doubt the manufacturers are entirely to blame for allowing this condition to become established. Special brands would never have gained the foothold they have if leading manufacturers had not adopted the insane policy of offering to sell their product under special brands for less money than when put up under their own factory brands. It should have been just the reverse. While it will take time to correct this evil, and while special brands will always be used to a greater or less extent, we trust that the time is not distant when manufacturers will take a united stand for intelligent action toward mitigating this evil as far as possible.

### Manufacturers Must Do Something

Without doubt the manufacturers are entirely to blame for allowing this condition to become established. Special brands would never have gained the foothold they have if leading manufacturers had not adopted the insane policy of offering to sell their product under special brands for less money than when put up under their own factory brands. It should have been just the reverse. While it will take time to correct this evil, and while special brands will always be used to a greater or less extent, we trust that the time is not distant when manufacturers will take a united stand for intelligent action toward mitigating this evil as far as possible.

### LETTER FROM A MANUFACTURER OF TACKS.

We find a very great deal of demand for special brands, more especially from the smaller jobbers. Some factories are catering to this demand, and it is very disadvantageous to the trade. There is no gain whatever to the manufacturer, nor increase in quantity of goods

sold, while it necessitates carrying a quantity of special packages, and sooner or later will result in a lot of these special packages being left on the manufacturer's hands.

### Special Brands Called for by Small Jobbers

It is a matter which should be avoided as much as possible. If the manufacturers would stand together and preserve their identity by insisting upon goods under their own brand and by putting out a quality of goods which they were willing to guarantee, we believe the results would be highly satisfactory to the manufacturer and jobber. We believe it would be far easier for the jobber to push the sale of a widely known brand of goods, or of one that was guaranteed by the factory, over their own name and address.

### A NEW ENGLAND MANUFACTURER WRITES:

We much prefer to furnish tools to our customers under our own brands—factory brands. We don't expect to hold a jobber's trade long when he insists in having his goods marked with his private brands, for eventually some other manufacturer gets the business, usually at a lower price (and the jobber usually gets a lower grade of goods). At the present time probably not over 5 per cent. of our product is marketed under jobbers' special brands.

### Cannot Hold Jobbers' Trade

### FROM ANOTHER TACK MANUFACTURER.

We beg to acknowledge receipt of your favor of the 15th inst., and in reply wish to say that even Tacks are sold under special brands to some extent. There are some manufacturers in our line who are willing to put up Tacks under a special brand in quantities as small as 5 gross. We have often been asked to figure on special brands, but we find that it is most always a most unsatisfactory business, owing to the fact that the orders are small in most cases and it requires considerable outlay for special printed boxes, and we have therefore declined to figure on such goods. We think that goods put up under special brands are a disadvantage to the manufacturer, as the buyers, as a rule, do not know much about the goods, but only buy the packages, and therefore cannot judge whether or not they get the quantity or quality of goods they purchase.

### Troublesome and Unsatisfactory

### NEW YORK STATE ASSOCIATION OF RETAIL HARDWARE DEALERS.

UNDER date of September 6 J. B. Foley, Syracuse, N. Y., secretary of the New York State Association of Retail Hardware Dealers, issues a circular to the membership, in which he calls attention to the accompanying pamphlet giving full report of the proceedings of the last annual meeting, and a leaflet, in which an article on "Mutual Insurance" in a recent issue of *The Iron Age* is reproduced. The privilege secured by membership in the association of taking out insurance at a material saving in cost in a number of Hardware mutual insurance companies is pointed out. The work of the National Association on the subject of catalogue house competition is also mentioned. Mr. Foley states that there has been a gratifying increase in the membership in several sections of the State, and urges the members in other parts to renewed efforts to bring in recruits, including for this purpose several application blanks.

GLOBE LAWN MOWER & MFG. COMPANY, Reading, Pa., has been incorporated under the laws of that State, with the following officers: D. Elmer Dampman, a contractor and builder, president; Peter B. Weldner, secretary and treasurer; A. L. Frame, manager, and Harry F. Schroeder, superintendent. The capital stock has been fully subscribed and paid in. The company will manufacture a high grade Lawn Mower of the ball bearing style, with adjustment of the cutter bar and other improvements protected by patent granted to Mr. Schroeder. The company expects to have its product on the market by October 1.

## FACTORY COST AND BUSINESS METHODS.

## EXPENSE ACCOUNTS OF MANUFACTURERS' SALESMEN.

BY PENNSYLVANIA.

**W**HAT items can be included in the list of legitimate traveling expenses which the employer should pay? Railroad fare, of course; likewise hotel bills, excess baggage, bus fares, sleeper charges and expenditures for postage and for telegrams concerning business. These

[illegible]

Form to Be Filled Out at End of Month and Forwarded to Headquarters.

Items can be made to cover fees and tips to servants, cigars and drinks taken with meals, and all the expenses which are directly incidental to the business of traveling, and it is the usual practice to so include them. But every man upon the road has other expenses which, while not directly connected with traveling, are incurred because he is away from home, and which he would not have if he had a house position. No matter which way he turns or what he does, every move costs money. Service

salesman often makes long trip and is away from home from three weeks to three months at a time. In all of this time he must be presentable in appearance. His barber bills are double what they would be if he were at home, and every item of personal expense is increased in like ratio. Should he personally bear the increase or should he charge it to the house—or, again, should "expenses" cover all expense of every kind incurred while upon the road? Nine out of every ten salesmen consider that all current expenditures while *en route* should go into the expense account, and will put them there, cloaking the doubtful items in the mantle of some expenditures that will not be questioned. The proprietor of a Pittsburgh iron house recently made a trip over one of his salesman's routes and discovered that in one city where cab fare was regularly charged the hotel patronized by the salesman was across the street from the station. A salesman has upon occasion spent the night with a friend without any seeming reduction in his hotel bills. In each instance, it is more than probable that the opportunity of swelling the account a trifle was taken advantage of in order to secure reimbursement for some item of expense which the salesman considered just, but which he feared his employer would not.

### REPRESENTATIVES OF GREAT HOUSES.

The managers of large houses whose goods pay an attractive profit often do not scrutinize very closely the expense reports of salesmen. In many of them the salesmen are not required to present an itemized account of expenditures. This is particularly the case with houses that employ but a few salesmen, who are men of more than average ability, and who are required to travel in a style commensurate with the house's prominence. There is then usually no desire to limit the expense, so long as the total cost of traveling is within reason.

If the head of the house occasionally takes a trip he is apt to be more lenient in his scrutiny of the expense account of his salesmen, for he can the more easily real-

Traveling Expenses of _____								for Month of _____		190__	
Date.	From	To.	M. R. Fare.	Steamer	Roa. & Bag.	Hotel.	Postage and Telegram.	Miscellaneous Expenditures Specified.		Totals.	
1											
2											
3											
4											
5											
6											
7											
8											
TOTALS,											

I hereby Certify that the above account is, to the best of my knowledge, a correct statement of all my traveling and other expenses incurred.

Exam'd and found correct, \_\_\_\_\_  
Department Manager

Approved for payment, \_\_\_\_\_  
Auditor

Salesman

Leaf from Vest Pocket Daily Memorandum Book.

is thrust upon him that fees may be obtained and all the enjoyment that he can get to while away the tedium of his evenings he must pay for on the spot.

### INCREASED PERSONAL EXPENDITURES.

If he makes short stops it is often difficult, if not impossible, to get any laundry work done, and new linen and underwear must be bought. The manufacturer's

ize the conditions which his men have to meet. Particularly in this the case if he accompanies the salesman, and gains a knowledge of his road life.

## A GROWING ECONOMY.

There is, however, a growing disposition on the part of the managers of large houses which employ a number of salesmen to insist upon itemized lists of expenditures.



The two specimens of expense report blanks given herewith are in use by two manufacturing concerns, each the largest in the country in its particular line. One of the forms is to be filled out at the end of the month and duly presented. The other is in the form of a vest pocket memorandum book, and it is expected that the salesman will make therein a daily record of his expenses, returning the book properly footed at the end of the month. The front cover of this memorandum book is intended for a record of "Money Drawn" during the month. The back cover is designed for "Expense Account Summary" for the month, under the head of railroad fare, excess baggage, hotel and sleeper, stage and car fare and sundries. The "Number of Days Out" and "Average Cost per Day" are also to be entered by the traveler.

#### SMALL CONCERNS

The men who travel for the smaller concerns have the least license in regard to their expenses. One Belting

### BURDITT & WILLIAMS COMPANY'S NEW STORE.

THE BURDITT & WILLIAMS COMPANY is the latest addition to the retail Hardware district on Summer street, Boston, and its new store is one of the finest in the city. The firm is an old one, dating from 1860, when the business was established in the store at 20 Dock Square, which has been occupied ever since. The new store at the corner of Summer and High streets does not replace the old one, which is continued for a portion of the company's retail business, the jobbing department and a part of the retail business being moved to the new stand. The Dock Square store has been the site of a Hardware store since 1796, according to the records, and to judge from the way business is coming to the present store there, in spite of it having become secondary to the new store, it is likely to be continued for years longer. The new store

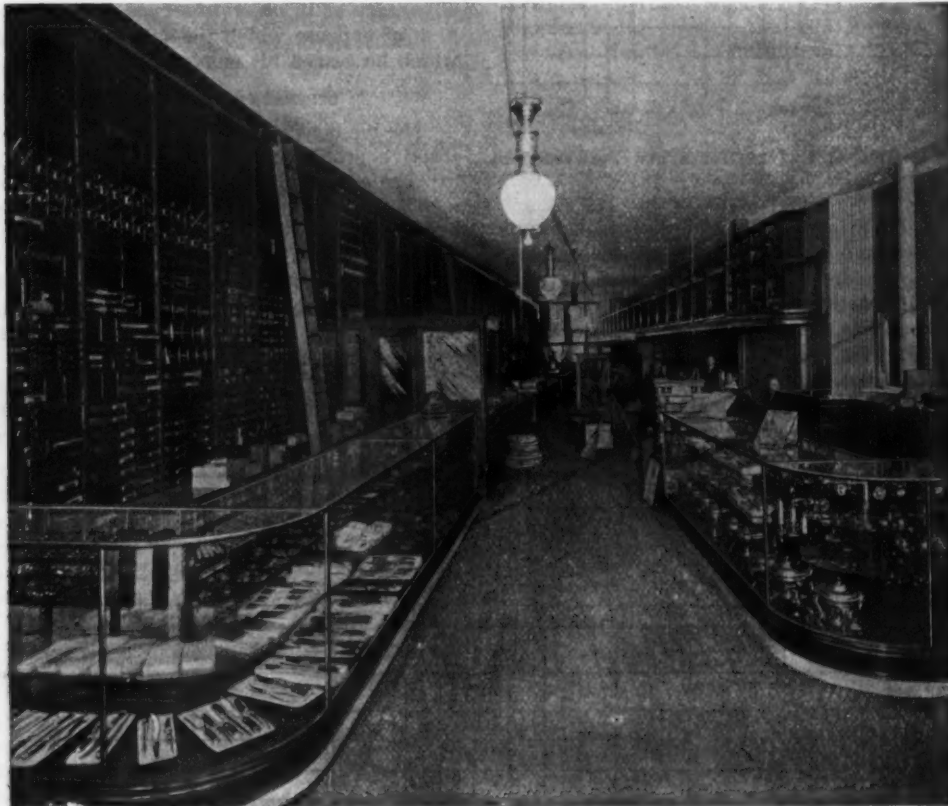


Fig. 1.—Salesroom of Burditt & Williams Company's Store.

manufacturer has been wont to hire young men with little if any experience, and to limit the expense to \$4 per day, traveling about the cities and towns of Ohio and Western Pennsylvania. The employer usually does some traveling or has formerly traveled, and as he has had to be frugal he knows the least that the territory can be covered for, and is disposed to hold his men to this figure. If the limit is not drawn too close the men fare satisfactorily, for they are as a rule not accustomed to the luxuries provided for the moneyed traveler and are well content to travel in the ordinary day coaches and put up at second-class hotels.

#### BRANCH HOUSES.

Many of the principal manufacturing industries are represented in the great selling centers by branch houses from which salesmen cover contiguous territory. The expenses of these salesmen are more carefully scrutinized than those of the men who cover the big jobbing trade, for the amount of business such salesmen bring in will not warrant lavish expenditure to get it. It is in such establishments that the itemized expense account is most strictly adhered to and expense and results most closely compared.

contains all that is modern in Hardware store methods, as shown in Fig. 1 of the accompanying illustrations. The store is 35 feet wide and 135 feet deep. A feature is the reception room or Builders' Hardware room, shown in Fig. 2, for which space otherwise not very valuable was utilized. The room is 35 by 15 feet, with vaulted ceiling. It is a beautiful room, in mahogany, the tinted ceiling being paneled in that color. The leaded crystal glass of the cabinets over the drawer cases adds to the effect. Between each pair of cabinet doors is a mahogany column with bronze capital. Mahogany tables in the center of the room afford opportunity for the inspection of goods. Electric lights within ground glass globes shed a pleasant light. As this is a room within a room, with no access out of doors, a system of ventilation was an imperative necessity. This question was solved very simply. All around the room, just above the molding which surmounts the cabinets, are a series of holes, as seen in Fig. 2 at the far end of the room. The holes open by means of small tubes into a large air pipe encircling the room on a level with the cornice. At an orifice in the large air pipe is a large electric fan which sends a constant supply of fresh air into the pipe and thence through the holes into the room, keeping the atmosphere fresh and cool. The business of the new

store is divided into three departments, jobbing, retail and builders' supplies. The new quarters have permitted the firm to add new lines and to extend old ones, among which are Electric Goods, household Cutlery and Optical Goods. The firm continues to carry the genuine Marty French Mouse and Rat Traps, for which it has had, for some time, the exclusive American selling rights.

### THE GOODWIN & KINTZ COMPANY.

**T**HE Goodwin & Kintz Company, Winsted, Conn., has just issued a large-paged catalogue, showing examples of its line of fine metal goods, which will be of interest to the increasing number of Hardware merchants who are on the lookout for lines of goods which can satisfactorily and profitably be added to those already handled by them. The catalogue calls special attention to their novelty Clocks, decorated Vases, metal Vases, with enameled

## ADVERTISING.

BY MARSHALL DE MOTTE.

*The subject is not treated in any abstract way, but considered practically, with special reference to newspaper publicity, such as can be used by an ordinary Retail Hardware Merchant.*

#### Fourth Paper.

#### HOW TO HAVE YOUR AD. SET IN TYPE.

**T**HIS is a problem that could easily be shrouded in mysterious measurements of picas and points, but we will avoid these technicalities as far as possible. You know from your experiences with other trades that it is not necessary to know all their tricks to understand their problems. This is as true of printing as of bricklaying. The printers have some traditions that they like to work in when they can, but as you are paying for the space



Fig. 2.—Reception or Builders' Hardware Room of Burditt & Williams Company.

bodies; Flower Holders, Candelabra and Candlesticks, Mirror Plateaux, Bust and Figures, &c. The company also makes a large variety of Gas and Electric Portables, Bronze Electrolers and electric lighting specialties, representing which special catalogues are issued.

Bond Hardware Company, San Antonio, Texas, has been incorporated with a capital stock of \$125,000, to conduct the wholesale and retail business at San Antonio, and also at Cameron and Houston, Texas. The company has acquired the interests of the C. H. Dean Company, San Antonio; Houston Hardware Company, Houston, and Bryant & Bond Company, Cameron, and will continue the stores as heretofore, only the Cameron and Houston stocks will be reduced. The San Antonio establishment, where wholesale stock will be carried, is 100 x 312 feet in dimensions. The company's stock includes Hardware, Cutlery, Bicycles, Stoves, Blacksmiths' Supplies, Paints, Glass, Vehicles, Implements, Saddlery, &c. J. H. Bond, Jr., who represented Belknap Hardware & Mfg. Company in Texas territory for ten years, is president of the new corporation; Chas. Wagner, secretary, and R. H. Wester of the Wester Savings & Trust Company, treasurer.

used you need not pay much attention to them. Never let them lose track of the fact that you want the ad. legibly set, with the accent properly placed and a display of type that will in no wise detract from the matter advertised.

Relevancy to your business I believe to be an absolute necessity in the matter of all cuts, and, by the way, this is a pretty good rule by which to measure window displays also. The most successful make it an invariable rule to use no headings or cuts in their ads. or displays in their windows that do not directly refer to their business and the goods they are trying to sell. All your cuts should be clear; I guess that's clear also, for we have all seen ads. where we wondered what the picture was intended for. Most of the cuts you will get hold of will be half-tones, zinc etchings or electrotypes of zinc etchings or wood cuts.

#### ZINC ETCHINGS OR THEIR ELECTROTYPES PREFERRED.

While it is possible occasionally to get a good "speaking likeness" from a half-tone, you will find more frequently, owing to poor printing, that you have a blotch that might be meant for anything, but that looks like nothing you ever saw before. The zinc etchings are made from pen drawings, and are clear and distinct in



their details, while in faithfulness they represent the drawings, and are every bit as true as they were. Wood cuts are tool engravings, or pictures, made directly on wooden blocks. These were formerly in general use before the zinc etching appeared. Electrotypes are copies, not of photos or drawings, but of cuts, and generally of zinc etchings or wood cuts. It is conceded among ad. men that the best cuts to use in newspaper advertising are the zinc etchings, or their electrotype copies, and these we commend to you. By the way, *The Iron Age* has published a lot of excellent advertising cuts for the Hardwareman's use, and you will find them so clear that you will always get good results from their use.

#### SIZE OF CUTS.

I guess one word more had better be said here, and that on the matter of size of your cuts. You see a newspaper column is a little more than 2 inches wide, so that if you bear this in mind and get cuts not over 2 inches wide you can use them in all single column ads., as well as all larger ads., but don't despise the smaller cuts. It's really remarkable what excellent effect can be obtained in quite large ads. with small cuts, say 1 inch wide. Such cuts are plenty large for all Kitchen Utensils and most Tools.

Here are three phases of this question that stand together and must be so considered. Size has something to do with the position necessary to make the ad. effective, and both size and position help to decide the questions of type. Hardware ads. will rank among the small advertisements, for you have few things in your store that require extensive display. This is to your advantage both in the cost of the advertising and the position obtainable, for your newspapers will give better position to small attractive ads. than they can give to the large ones. Space no larger than 3 to 8 inches, single column, can be made very effective in ads. without cuts, or with only small cuts.

Then, when you have the opportunity to make something of a spread with a Spring Sale, or a Holiday Sale, or anything else you happen to think of, you can make a large ad. by simply adding several groups together, and putting over the whole your excuse for having this sale at this time. We who spend all our time on ads. seldom less than a page in size work them out much as you will the small one; that is, with a leader, or in the big ads. a bunch of leaders, and then a lot of other items arranged around them to get the benefit of their drawing power. For an ordinary retail Hardware store there is absolutely nothing about big ads. that gives them value over small ads. in proportion to their size. Great stores are almost invariably great advertisers, but this is because of the great variety of their stocks and the demands of their customers.

#### POSITION IS A HARD PROPOSITION

to settle, for there is little preferred space and many demands upon it. Top of the column, next to reading matter and on the local page is the top notch of position, but newspapers generally charge extra for this. If you can get it you will do well. On a proposition to be always put next to reading matter, but at the bottom of the local page, I should take the offer rather than a promise to be placed in the best place when nobody else wanted it. Better be permanently located on a poorer street than to be ever changing locations on the best. And it's the same in ad. position. Big ads. will take care of themselves, but you can tell your newspaper man that he should foster and encourage his small advertisers that they may grow into large advertisers, and that you want the fostering. Keep after him, he needs it.

Be sure to have the printer use a plain series of type for all the display lines and never more than one series. I mean by this a single style of type. Then for the body of the ad. have him use the same type as in the body of his paper. It's a good plan to use few display lines, and what you do use make strong. I have spoken

**Type and Display** in the paper on "How to Write Your Advertisement" of opening phrases, or headlines.

Study these with regard to the size of both your ad. and the type you wish to use. As an illustration of how the same words will work out in the different

sizes of a series just notice these lines in popular De Vinne type in sizes ranging from 8-point to 30-point, and each line the length of your single column width, after allowing for the border:

8 pt.	De Vinne Type Series is good 1234
10 pt.	De Vinne Type Series is good 12
12 pt.	De Vinne Type Series is
18 pt.	De Vinne Type S
24 pt.	De Vinne Ty
30 pt.	De Vinne T

You can see by these lines about how much you can get into each line of a single column ad., for almost all newspaper columns are, as they say, 13 pica ems wide—that is 2 1-6 inches. The 1-6 is needed for the border, leaving just 2 inches for type, as above.

Borders form a part of the type composition, and here is another place to study simplicity. It is also a field for much ingenuity, and it will pay you to watch the magazine ads. for suggestions along this line. For reasons already stated you will find it to your advantage to put your signature at the bottom of your ad. In this connection let me suggest that

**Border and Signature** if you do not care to go to the expense of having a suitable cut made of your signature, have your printer set up in a compact and distinctive way your store name or firm name, and always use this same set up. You see it is a good deal like your personal signature and should always be the same. One point in which it differs is in the absolute necessity that it should be distinct and instantly readable. Don't make the mistake of thinking your own name the most important line in the ad. Put your strongest accent on your opening. If that interests them they'll find your name, even though it's in small type.

All that has been said about your ad. being your salesman on the outside, representing you to people who may not have as yet gotten acquainted with your store, may be dissipated by a foolish or trifling display of fancy type, irrelevant cuts or misplaced accents. Guard carefully these points. You would hardly send out a fancifully dressed youth to solicit business for a Hardware store, and you will get little better work from a fancifully gotten up ad. The simple facts of your business should be stated and printed in the simplest possible manner, so that he who literally runs may read your ads. and get the full meaning, and, above all, be impressed with the fact that you have just what he wants and that your prices are right.

#### DEATH OF ALLEN BOUCHER.

**A** LLEN BOUCHER, secretary and treasurer of the Caldwell Mfg. Company, Rochester, N. Y., died at his home in that city September 13, after an illness of three weeks. Mr. Boucher was born in North East, Dutchess County, N. Y., in 1859, and was a brother of James H. Boucher of Mathews & Boucher, Rochester. Allen Boucher went to the latter city in 1883 as an employee of Hamilton & Mathews, the predecessors of Mathews & Boucher. He remained with them about six years as cashier, and then became identified with the Caldwell Mfg. Company, where his Hardware knowledge enabled him to take an active part in successfully establishing the business. Mr. Boucher was greatly respected by the principals and buyers of leading Hardware houses for his sterling character, worth and business ability. He is survived by a widow and two sons.

Chas. Isaacs has lately opened up in business at Leland, Iowa, handling Shelf Hardware, Tinware, Agricultural Implements, &c.

**PRICE-LISTS, CIRCULARS, &c.**

*Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.*

**EAGLE LOCK COMPANY**, Terryville, Conn.: Supplemental pages relating to Trunk, Pad and Drawer Locks, &c., for insertion in its catalogue, volume 18.

**D. M. STEWARD MFG. COMPANY**, Chattanooga, Tenn.: Map and guide of the World's Fair grounds, St. Louis.

**WEED & Co.**, Buffalo, N. Y.: Supplementary pages relating to Paint. Casters, Fillet, Levels, Pipe and Flange Wrenches, &c.

**THE NEW JERSEY FOUNDRY & MACHINE COMPANY**, 9 to 15 Murray street, New York, engineering department: Illustrated pamphlet catalogue of the Omega Toggle Bolt for fastening lamp brackets, rosettes, insulators, telephones, &c., to hollow brick, tile, thin marble, metal, and wood or metal lathing.

**THE ORR & LOCKETT HARDWARE COMPANY**, Chicago: A new edition of its "Red Book," devoted to Manual Training Benches and Tools. This catalogue contains nearly 100 pages, closely printed and liberally illustrated, the entire contents being devoted to descriptions of Outfits, Tools and Supplies necessary for manual training schools. This is a line in which the company has specialized for a number of years, and one in which a large and growing business has been built up.

**THE S. J. STEBBINS HARDWARE COMPANY**, 74 Van Buren street, Chicago: Catalogue No. 10, which is handsomely printed on heavy paper and attractively bound. This catalogue covers a general line of Hardware, Cutlery, Tools and Supplies such as are used by machinists, carpenters, plumbers, painters, iron workers, tinners, upholsterers and other trades. The line of Cutlery illustrated is particularly large and varied, while the 45 pages devoted to Carpenters' and Wood Workers' Tools are more than usually interesting, because of the extensive line of tools and appliances which are described and which are offered at attractive prices. A discount sheet accompanies the catalogue.

**AMONG THE HARDWARE TRADE.**

**West & Mossop**, Marlon, Ind., have disposed of their Hardware business to **Hogen & McKinney**, who have removed the stock to their own store.

**R. Dunnett** has sold his interest in the **French-Dunnett Company**, Inman, Kan., to **P. J. Pankratz**, and the style has been changed to **French, Pankratz & Co.**, who continue the Hardware business at the old stand.

**A. H. Boles** has purchased the Hardware, Stove, Paint, Farm Implement and Sporting Goods business of **Wm. Irelan**, Drakesville, Iowa.

**Sutton Hardware Company**, Goldsboro, N. C., has been incorporated with a capital stock of \$25,000, \$5000 paid in, by **Mrs. Henrietta Sutton**, **Mrs. Mamie E. Griffin**, **J. R. Griffin** and **Thomas I. Sutton**.

**Snyder Hardware Company**, Louisa, Ky., has purchased the **Snyder & Belcher Hardware** stock at Ironton, Ohio, and is removing it to the former place, where they carry on a wholesale and retail business in General Hardware.

**Hope Hardware Company**, Hope, Ark., has incorporated with a capital of \$50,000, to carry on the wholesale and retail business in Shelf and Heavy Hardware, Sash and Doors, Queensware, Saddlery, &c.

**C. G. Emerson**, Pittsburg, Kan., has succeeded to the **Pittsburg Hardware Company**, and, with a full line of General Hardware, Stoves, Tinware, Sporting Goods, &c., will continue at the old stand under the same style.

**MISCELLANEOUS NOTE.****Eagle Mop Wringers.**

The **Eagle Cooperage Works**, Circleville, Ohio, now manufacture their mop wringers in three sizes: Domestic, for household use; Standard, the size made heretofore, and Janitor's size, this being larger than the Standard. The company has started the manufacture of cotton mops of all descriptions and sizes, and is prepared to supply the trade in any quantity.

**Miniature Pistol Watch Charm.**

The cuts herewith represent a miniature pistol watch charm. The pistol is referred to as being the smallest pistol in the world shooting a real cartridge. It is designed to be a perfect reproduction in miniature of a large dueling pistol, and makes a loud report when shot. It is

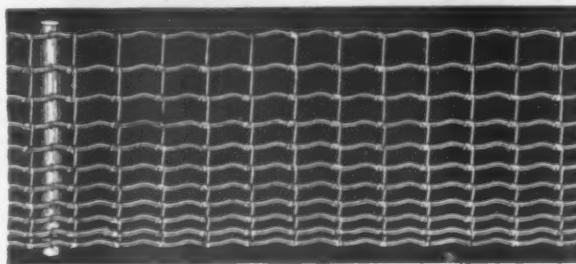


*Miniature Pistol Watch Charm.*

finished in nickel plate and furnished with ebony and ivory handles. The pistols are packed one each in a small box, with one dozen cartridges, to retail for 50 cents. Cartridges may be purchased separately, if desired. The pistol is manufactured by **Davidson Mfg. Company**, 112 Front street, Brooklyn, N. Y.

**Cyclone Woven Wire Fence.**

We herewith illustrate a section of the **Cyclone spring woven wire fencing**, made by the **Cyclone Woven Wire Fence Company**, Waukegan, Ill. The lateral wires of the fence are made of high carbon steel, and the vertical or cross wires of annealed wire. The knot is formed by winding the annealed cross wire around the line wire, there being just enough offset or corrugation in the line



*Cyclone Woven Wire Fence.*

wire to prevent the tie slipping. The fence is made in a number of styles, from 8 to 12 bar, and from 45 to 58 inches high. Two catalogues are issued by the company, one of which is devoted largely to the **Cyclone spring steel fence** just described, together with directions for erecting it, and the other, a larger one, describing a large and varied line of ornamental fence and gates made by the same company.



### Wilcox Omega Ceiling Ladder.

The Wilcox Mfg. Company, Aurora, Ill., is just placing on the market a new store ladder which, it is claimed, cannot be derailed, is noiseless, adjustable to inequalities of floor and track and unusually heavy in its construction. This ladder, Fig. 1, depends from independent trucks running on two parallel overhead tracks. The

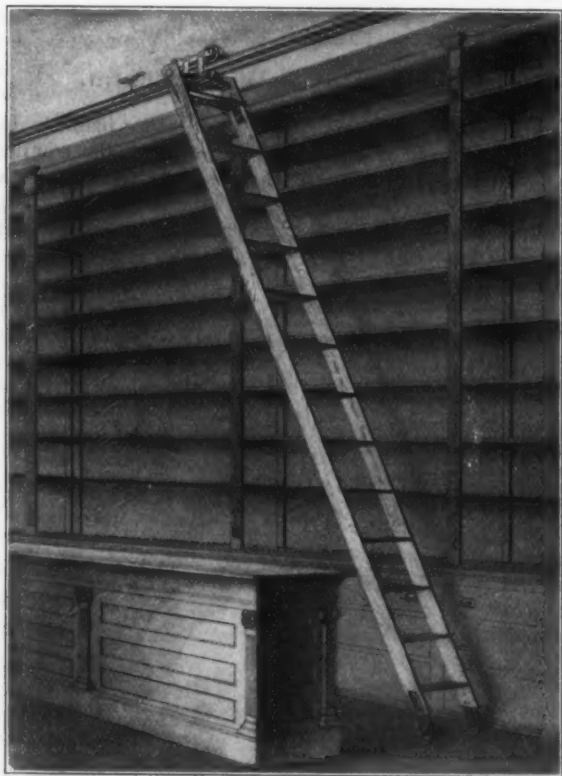


Fig. 1.—Wilcox Omega Ceiling Ladder.

trucks are made of steel, with hardwood guides, the wheels running on either track being independent of those on the other, so that any inequalities in the floor or track are compensated for, thus avoiding binding or a twisting tendency. The tracks are attached to the ceiling by means of brackets provided with adjustable lock nuts, so that the tracks may be leveled. Details of mechanism are shown in Fig. 2. The floor wheels are ad-

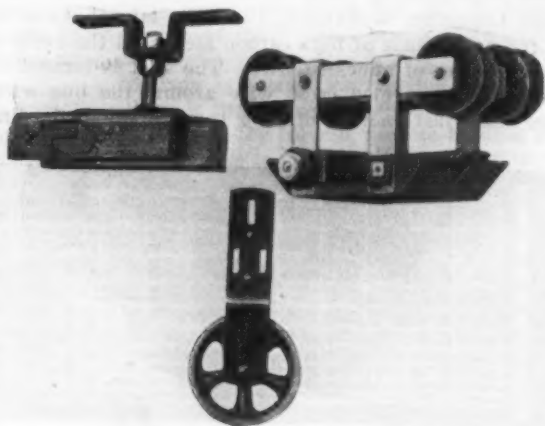


Fig. 2.—Details of Mechanism.

justable, so that they can be made to run true even on a sloping floor, and their rubber tires make the tracks practically noiseless. This form of ladder is intended for warehouses and stores where heavy work is done, and all parts of the mechanism are made unusually strong and heavy. Ease in operation is accomplished by means of roller bearings, which reduce friction to a minimum. The ladders are made in various lengths to suit buyers'

requirements. The same firm also manufactures what is known as the Perfection shelf ladder, which runs upon a track at the top of the shelf and rests against the ledge at the base. The track is made of polished oak and has a section of steel inserted the entire length, which serves to strengthen the track and to add security to the joints. The weight is carried entirely by the upper fixture, the lower rails acting simply as a guide.

### Morrill Nail Puller.

Charles Morrill, 277 Broadway, New York, has just put on the market as here illustrated the Morrill No. 1 nail puller, which has several distinguishing features. As seen in Fig. 1 it is 18 inches long, with a thrust or ramming distance of 5 inches. Fig. 2 is a sectional view of the working portion opposite the foot, showing about actual size the parts to reduce wear on pin to a minimum, insure a correct alignment and prevent spreading apart of jaws after a period of use. This construction also permits the use of a pin instead of a rivet. Especial attention is called by the manufacturer to the foot, which

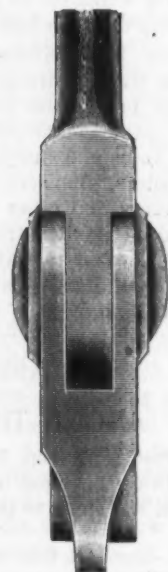


Fig. 1.—Morrill Nail Puller. Fig. 2.—Rear View of Working Parts.

is referred to as so shaped that as much again drawing power can be developed as with the ordinary shaped foot, thus greatly increasing the ease with which even cement coated nails can be drawn, which likewise leaves them in a condition for using again without straightening. No springs are used, a small ball of metal on the end of the foot as a counterweight serving the purpose of a spring and eliminating the annoying spring breakage. The shank has a handle and hand guard forged integral with it, preventing any risk of pinching or bruising hand in ramming. The shank is made on the model of an I-beam, thus combining strength and lightness. Both foot and shank are drop forged from fine tool steel and blued, giving the article a handsome and salable appearance. The puller is warranted by the manufacturer to pull any kind of nail with or without head.

The Central Hardware Company, Independence, Kan., of which Brown, Eldridge & Chandler are proprietors, has purchased the stock of Hardware, Paints, Oils, &c., of A. L. Partridge and will conduct the business at the old stand.

### Stevens' New Rifle Telescopes.

J. Stevens Arms & Tool Company, Chicopee Falls, Mass., is introducing new rifle telescopes, as shown in the accompanying illustrations. Fig. 1 shows a telescope with aperture and pin head, which is referred to as a decided innovation in the telescope line. Hereto-



Fig. 1.—Aperture and Pin Head Telescope.

fore, the rifle telescope has been fitted with cross hairs, and, it is remarked, while it is generally conceded to be the best form of sight, there are shooters who think they cannot use it, and for this class the form of telescope illustrated has been designed. It is made in exact proportion to the ordinary sights, and in one size only. The telescope is especially designed for these sights, and cannot be applied to telescopes of other make. These are furnished with the company's detachable mounts, and have a power of five diameters. In Fig. 2 is illustrated the Little Off Hand telescope, the tube of which is only  $\frac{1}{2}$  inch diameter and  $12\frac{1}{2}$  inches long, with proportionately detachable mountings. It can be instantly removed



Fig. 2.—Stevens' Little Off Hand Telescope.

from the rifle, and replaced without disturbing its adjustment, having a narrow steel rib sliding in a groove in the forward mount, with fine screw adjustment for both windage and elevation. The field is not as large as in the ordinary telescope, but as this one is designed for target work the matter of field is alluded to as unimportant. As regards brilliancy and definition, it is equal to the larger telescopes of the same power, it is explained. The telescope does not necessitate an extra case for the rifle, as the telescope can be instantly removed and carried in the pocket. Although intended for a target glass it may be also used for hunting purposes. The power is four diameters.

### The Lee Ankle and Instep Supports

The Dubuque Harness & Saddlery Company, Dubuque, Iowa, is placing on the market the Lee ankle support and



Fig. 1.—Lee Ankle Support.

the Lee instep support, which we illustrate herewith. The ankle support is made from leather in one piece, fitting over the shoe and conforming to the shape of the

ankle. It is made in sizes for children, misses, boys and men in russet or black. The instep support, which com-

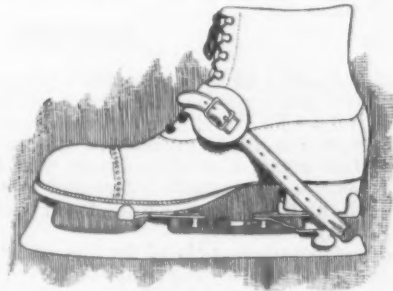


Fig. 2.—Lee Instep Support.

bines with it a skate strap, braces the instep and prevents the skate buckle hurting the foot.

### Perfection Pocket Match Safe and Cigar Cutter

The accompanying cuts represent a combined match safe and cigar cutter. Opening the match safe causes the cutter to lift, or the cutter may be raised by means of a slight projection at its top. Independent of the cover. Closing the cover does not lower the cutter, which is



Perfection Pocket Match Safe and Cigar Cutter.

device is offered by the Universal Hardware Mfg. Company, Watervliet, N. Y.

The Durham Hardware Company, Lansing, Mich., has recently been organized, and will do a retail business in Miscellaneous Hardware, Paints, Sporting Goods, &c. An addition, 40 by 70 feet, has been erected, which will be used as a salesroom for Buggies and Harness.



# Current Hardware Prices.

REVISED SEPTEMBER 20, 1904

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33 1/2 @ 33 1/2 & 10% signifies that the

price of the goods in question ranges from 33 1/2 per cent. discount to 33 1/2 and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1904, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters, Blind—

Domestic,  $\frac{1}{2}$  doz. \$3.00..... 33 1/2 @  
North's..... 10%

Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent..... 35%  
Taplin's Perfection..... 35%

**Ammunition**—See Caps, Cartridges, Shells, &c.

## Anvils—American—

Eagle Anvils.....  $\frac{1}{2}$  doz. \$7.40 @ 7.40  
Hay-Budden, Wrought..... 30 @ 9.40  
Horseshoe brand, Wrought..... 30 @ 9.40  
Trenton.....  $\frac{1}{2}$  doz. \$9.40 @ 9.40

## Imported—

Peter Wright & Sons.....  $\frac{1}{2}$  doz. \$10.40 @

## Anvil, Vise and Drill—

Millers Falls Co., \$18.00..... 15 & 10%

**Apple Parers**—See Parers, Apple, &c.

## Aprons, Blacksmiths'—

Hull Bros. Co..... 30%  
Livingston Hall Co..... 30%

## Augers and Bits—

Com. Double Spur..... 75 @ 75 & 5%

Boring Machine Augers..... 65 @ 70%

Car Bits, 12-in. twist..... 60 @ 60 & 10%

Jennings' Pattern..... 50 @ 100 & 5%

Ford's Auger and Car Bits..... 40 @ 5%

Forster Pat. Auger Bits..... 25 @ 5%

C. E. Jennings & Co..... 25%

No. 10 ext. lip. R. Jennings' list..... 25%

No. 30. R. Jennings' list..... 10 & 7%

Russell Jennings' list..... 50 @ 100 & 5%

L'Hommedieu Car Bits..... 15%

Mayhew's Countersink Bits..... 40%

Millers Falls..... 50 @ 100 & 5%

Ohio Tool Co.'s Bailey Auger and Car Bits..... 40 @ 10%

Pugh's Black..... 30%

Pugh's Jennings' Pattern..... 30%

Small's Auger Bits..... 60%

Small's Bell Hangers' Bits..... 60%

Small's Car Bits, 12-in. twist..... 60 @ 10%

Wright's Jennings Bits (R. Jennings' list)..... 50%

## Bit Stock Drills—

See Drills, Twist.

## Expansive Bits—

Clark's small, \$18; large, \$20..... 50 @ 10%

Clark's Pattern, No. 1,  $\frac{1}{2}$  doz. \$26;..... 50 @ 10%

No. 2, \$15..... 50 @ 10%

Ford's, Clark's Pattern..... 50 @ 10%

C. E. Jennings & Co., Steer's Pat..... 25%

Swan's..... 60%

## Gimlet Bits—

Common Double Cut, gro. \$3.00 @ 3.25

German Pattern..... gro. \$4.50 @ 4.75

## Hollow Augers—

Bonney Pattern, per doz. \$10.00 @ 11.00

Ames..... 35 @ 10%

New Patent..... 35 @ 10%

Universal..... 20%

Wood's Universal..... 25%

## Ship Augers and Bits—

Ford's..... 40%

C. E. Jennings & Co..... 15%

L'Hommedieu's..... 35 & 5%

Watrous's..... 40%

Ohio Tool Co.'s..... 40%

Small's..... 40%

## Awl Hafts, See Hafts, Awl.

## Awls—

Brad Awls:

Handled..... gro. \$2.75 @ 3.00

Unhandled, Shouldered, gro. \$3 @ 3.60

Unhandled, Patent..... gro. 60 @ 70%

Peg Awls:

Unhandled, Patent..... gro. 31 @ 3%

Unhandled, Shouldered, gro. 65 @ 70%

Scratch Awls:

Handled, Common, gro. \$3.50 @ 4.00

Handled, Socket..... gro. \$11.50 @ 12.00

Hurwood..... 40%

## Awl and Tool Sets—See

Sets, Awl and Tool.

## Axes—

Singl. Bit, base weights (up to 3 1/2 lb.).

First Quality..... \$6.50

Second Quality..... \$5.75

NOTE.—Heavier Weights add Extras as per regular schedule.

**Axle Grease**—See Grease, Axle

## Axles—

Concord. Loose Collar..... 4 @ 10%

Concord. Solid Collar..... 4 @ 10%

No. 1 Common..... 3 1/2 @ 3 1/2

No. 1 1/4 Com. New Style..... 3 1/2 @ 3 1/2

No. 2 Solid Collar..... 4 1/2 @ 5%

Nos. 7, 8, 11 and 12..... 7 1/2 @ 7 1/2

Nos. 13 to 14..... 7 1/2 @ 7 1/2

Nos. 15 to 16..... 7 1/2 @ 7 1/2

Nos. 17 to 18..... 7 1/2 @ 7 1/2

Nos. 19 to 20..... 7 1/2 @ 7 1/2

Nos. 21 to 22..... 7 1/2 @ 7 1/2

Nos. 23 to 24..... 7 1/2 @ 7 1/2

Nos. 25 to 26..... 7 1/2 @ 7 1/2

Nos. 27 to 28..... 7 1/2 @ 7 1/2

Nos. 29 to 30..... 7 1/2 @ 7 1/2

Nos. 31 to 32..... 7 1/2 @ 7 1/2

Nos. 33 to 34..... 7 1/2 @ 7 1/2

Nos. 35 to 36..... 7 1/2 @ 7 1/2

Nos. 37 to 38..... 7 1/2 @ 7 1/2

Nos. 39 to 40..... 7 1/2 @ 7 1/2

Nos. 41 to 42..... 7 1/2 @ 7 1/2

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Nos. 171 to 172..... 7 1/2 @ 7 1/2

Nos. 173 to 174..... 7 1/2 @ 7 1/2

Nos. 175 to 176..... 7 1/2 @ 7 1/2

## White Metal..... 60%

Nickel Plated..... 50 @ 10 @ 50 @ 10 @ 5%

Swiss..... 60 @ 60 @ 1%

Cone's Glove Hand Bells..... 3 1/2 @ 3 1/2

Silver Chime..... 80 @ 80 @ 5%

Miscellaneous..... 10 @ 10 @ 5%

Form Bells..... 10 @ 10 @ 5%

Steel Alloy Church and School..... 60 @ 10 @ 50 @ 5%

American Tube & Stamp'g Co. Gongs..... 75%

Table Call Bells..... 50 @ 50 @ 10%

Belting—Rubber—

Agricultural (Low Grade)..... 75 @ 75 @ 5%

Common Standard..... 70 @ 70 @ 10%

Standard..... 65 @ 70%

Extra..... 60 @ 60 @ 10%

High Grade..... 50 @ 50 @ 10%

Leather—

Extra Heavy, Short Lap..... 60 @ 60 @ 5%

Regular Short Lap..... 60 @ 60 @ 10%

Standard..... 70 @ 70 @ 5%

Light Standard..... 70 @ 70 @ 5%

Cut Leather Lacing..... 60 @ 10%

Leather Lining Sides, per sq. ft. 18c

Bench Stops—See Stops, Bench

Benders and Upsetters,

Tire—

Detroit Perfected Tire Bender..... 40%

Green River Tire Benders and Upsetters..... 30%

Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25; No. 3, \$10.50; No. 4, \$16.25; No. 5, \$20.50.

Bicycle Goods—

John S. Long's Son's 1903 list:

Chain..... 50%

Parts..... 50%

Spokes..... 50%

Tubes..... 50%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—

See Augers and Bits.

Blocks—Tackle—

Common Wooden..... 70 @ 10 @ 75 @ 5%

Hollow Steel Blocks, with Ford's Patent Sheave..... 50 @ 10%

Lane's Patent Automatic Lock and Junior..... 30%</

**Can Openers—See Openers, Can**

**Cans, Milk—**  
 Illinois Pattern, #1 35 1.35 2.05 each.  
 New York Pattern, #1 35 2.20 2.45 each.  
 Baltimore Pattern, #1 35 2.20 2.45 each.  
 Dubuque, #1 35 1.35 1.60 1.75 each.

**Cans, Oil—**

Buffalo Family Oil Cans:  
 3 5 10 gal.  
 \$48.00 60.00 129.60 gro., net

**Caps—Perforated—**

Eley's E. B. .... 58¢@56¢  
 G. D. .... per M 34¢@35¢  
 F. I. .... per M 40¢@45¢  
 G. E. .... per M 48¢@50¢  
 Musket, .... per M 68¢@69¢

**Primers—**

Berdan Primers, \$2.00 per M. .... 80¢@78¢  
 B. L. Caps (Sturtevant Shell) .... 20¢  
 \$2.00 per M. .... 80¢@78¢  
 All other primers per M. \$1.53¢@1.60

**Cartridges—**

Blank Cartridges:  
 32 C. E., \$5.50 ..... 10¢@5¢  
 32 C. E., \$7.00 ..... 10¢@5¢  
 32 cal. Rim, \$1.60 ..... 10¢@5¢  
 32 cal. Rim, \$2.75 ..... 10¢@5¢  
 B. B. Caps, Con., Ball Sngl. .... \$1.90  
 B. B. Caps, Round Ball ..... \$1.40  
 Central Fire ..... 35¢  
 Target and Sporting ..... 1¢@5¢  
 Primed Shells and Bullets ..... 10¢@10¢  
 Rim Fire Sporting ..... 50¢  
 Rim Fire, Military ..... 15¢@5¢

**Castors—**

Bed, .... 70¢@70¢10¢  
 Plate ..... 60¢@60¢10¢  
 Philadelphia, .... 75¢@75¢5¢  
 Acme, Ball Bearing ..... 38¢@38¢  
 Boss, .... 70¢@10¢  
 Ross Anti-Friction ..... 70¢@10¢  
 Gen. (Roller Bearing) ..... 80¢  
 Martin's Patent (Phonix) ..... 45¢  
 Standard Ball Bearing ..... 45¢  
 Tucker's Patent roll list ..... 30¢  
 Yale (Double Wheel) roll list ..... 50¢

**Cattle Leaders—**

See Leaders, Cattle.

**Chain, Coil—**

American Coil, Straight Link:  
 5-16 5-16 3/4 7-16 3/4 9-16  
 7-16 5-16 4-16 3-16 2-16 1-16  
 3-16 2-16 1-16 1/2 1/4 1/8  
 3-16 3-16 2-16 2-16 2-16 2-16  
 German Coil ..... 60¢@10¢10¢70¢

**Halters and Ties—**

Halter Chains, .... 60¢@10¢10¢10¢  
 German Pattern Halter Chains, Ist  
 July 24, '97 ..... 60¢@10¢10¢  
 Cow Ties ..... 60¢@10¢10¢

**Trace, Wagon, &c.—**

Traces, Western Standard, 100 pair  
 6-1/2—6-3/4, Straight, with ring, \$23.50  
 6-1/2—6-3/4, Straight, with ring, \$31.50  
 6-1/2—6-3/4, Straight, with ring, \$38.00  
 6-1/2—10-3/4, Straight, with ring, \$32.00  
 Add 2¢ per pair for Hoops.  
 Traces 2¢ per pair higher than  
 Straight Link.  
 Trace, Wagon and Paney Chains, ....  
 60¢@10¢10¢5¢

**Miscellaneous—**

Jack Chain, list July 10, '93:  
 Iron, .... 60¢@10¢10¢10¢5¢  
 Brass, .... 60¢@10¢10¢10¢5¢  
 Safety Chain, .... 75¢@75¢10¢5¢  
 Gal. Pump Chain, .... 1/2 3/4 1/2 1/4  
 Covert Mfg. Co.  
 Breast, .... 40¢@25¢  
 Halter, .... 40¢@25¢  
 Heel, .... 40¢@25¢  
 Keel, .... 40¢@25¢  
 Stallion, .... 40¢@25¢  
 Covert Saddle Works:  
 Breast, .... 70¢  
 Halter, .... 70¢  
 Hold Back, .... 70¢  
 Rein, .... 70¢  
 Onida Community:  
 Am. Oil and Hardware, .... 40¢@10¢5¢  
 Am. Cow Ties, .... 45¢@50¢  
 Eureka Coll and Halter, .... 45¢@50¢  
 Niagara Coll and Halter, .... 45¢@50¢  
 Niagara-a Cow Ties, .... 45¢@50¢  
 Niagara Wire Dog Chains, .... 45¢@50¢  
 Wire Goods Co.:  
 Dog Chain, .... 70¢@10¢  
 Universal Dog-Chain, .... 50¢  
 Chalk—(From Jobbers.)  
 Carpenters' Blue, .... gro. 35¢@36¢  
 Carpenters', Red, .... gro. 35¢@36¢  
 Carpenters', White, .... gro. 25¢@36¢  
 See also Crayons.

**Checks, Door—**

Bardley's, .... 45¢  
 Columbia, .... 50¢@10¢  
 Eclipse, .... 60¢@10¢

**Chests, Tool—**

American Tool Chest Co.:  
 Boys' Chests, with Tools, .... 50¢  
 Youths' Chests, with Tools, .... 40¢  
 Gentlemen's Chests, with Tools, .... 30¢  
 Farmers', Carpenters', etc., Chests,  
 with Tools, .... 30¢  
 Machinists' and Fip's Fitters' Chests,  
 Empty, .... 40¢  
 Tool Cabinet's, .... 50¢  
 C. E. Jennings & Co.'s Machinists' Tool  
 Chests, .... 33¢@10¢

**Chisels—**

Socket Framing and Firmer  
 Standard List, .... 70¢@10¢75¢10¢  
 Buck Bros ..... 30¢  
 Charles Buck ..... 30¢  
 C. E. Jennings & Co. Socket Firmer  
 No. 10, .... 60¢  
 C. E. Jennings & Co. Socket Framing  
 No. 15, .... 70¢  
 Ohio Tool Co.'s, No. 181, .... 70¢  
 Swan's, .... 70¢  
 L. & J. White, .... 80¢@30¢5¢

**Tanged—**

Tanged Firmers, .... 40¢@5¢@10¢  
 Buck Bros ..... 30¢  
 Charles Buck ..... 30¢  
 C. E. Jennings & Co., No. 181, .... 70¢  
 L. & J. White, Tanged, .... 80¢@30¢5¢

**Cold—**  
 Cold Chisels, good quality, lb. 13¢@15¢  
 Cold Chisels, fair quality, lb. 11¢@12¢  
 Cold Chisels, ordinary, lb. 9¢@10¢

**Chucks—**

Bench Pat., each \$5.00 ..... 35¢@5¢  
 Pratt's Positive Drive ..... 25¢  
 Empire ..... 25¢  
 Blacksmiths' ..... 25¢  
 Skinner Patent Chucks:  
 Independent Lathe Chucks ..... 50¢  
 Universal ..... 50¢  
 Combination ..... 50¢  
 Drill Chucks, New Model ..... 40¢  
 Drill Chucks, Standard ..... 40¢  
 Drill Chucks, Skinner Patent, 0, 1, 2, 4, 5, 6, 7, 8 ..... 40¢  
 Planer Chucks ..... 25¢  
 Face Plate Jaws, .... 40¢  
 Standard Tool Co.:  
 Improved Drill Chuck ..... 45¢  
 Union Mfg. Co.:  
 Combination ..... 50¢  
 Gear Drill ..... 50¢  
 Combination Geared Scroll ..... 40¢  
 Geared Scroll ..... 40¢  
 Independent ..... 50¢  
 Independent Steel ..... 40¢  
 Union Drill ..... 50¢  
 Universal ..... 50¢  
 Independent Iron Face Plate Jaws, 40¢  
 Independent Steel Face Plate Jaws, 40¢  
 Westcott Patent Chucks:  
 Lathe Chucks ..... 50¢  
 Little Giant Auxiliary Drill ..... 50¢  
 Little Giant Double Grip Drill ..... 50¢  
 Little Giant Drill, Improved ..... 50¢  
 Oneida Drill ..... 50¢  
 Scroll Combination Lathe ..... 50¢

**Clamps—**

Adjustable, Hammers, .... 90¢@20¢5¢  
 Cabinet Sargent's ..... 50¢@10¢  
 Carriage Makers', F. S. & W. Co., .... 50¢  
 Carriage Makers' Sargent's ..... 60¢  
 Besv. Parallel ..... 35¢@10¢  
 Linemans' Udea Drop Forge & Tool Co. 40¢  
 Saw Clamps, see Vices, Saw Filers.

**Cleaners, Drain—**

Iwan's Champion, Adjustable ..... 55¢  
 Iwan's Champion, Stationary ..... 45¢

**Sidewalk—**

Star Socket, All Steel, .... doz. \$4.05 net  
 Star Shank, All Steel, .... doz. \$3.24 net  
 W. & C. Shank, All steel, doz. 7 1/2 in.,  
 \$3.00; 8 in., \$3.25.

**Cleavers, Butchers—**

Foster Bros. .... 30¢  
 New Haven Edge Tool Co., .... 45¢  
 Fayette R. Plumb, .... 35¢@33¢@10¢  
 L. & J. White, .... 30¢

**Clippers—**

Chicago Flexible Shaft Company:  
 '93 Chicago Horse ..... \$8.75 @ 35¢  
 1902 Chicago Horse ..... \$10.75 @ 35¢  
 20th Century Horse, each, \$5.00 ..... 30¢  
 Lightning Belt ..... \$15.00 @ 1¢  
 Chicago Belt ..... \$20.00 @ 1¢  
 Stewart Patent Slicer, \$12.75 ..... 30¢

**Finger Nail Clippers—**

Smith & Hemenway Co., .... doz. net \$2.00

**Clips, Axle—**

Eagle 5-16 and 3/4 inch ..... 75¢@75¢10¢  
 Norway, 5-16 and 3/4 inch, nec. 60¢@10¢70¢

**Cloth and Netting, Wire—**

See Wire, &c.

**Cocks, Brass—**

Hardware list:  
 Compression, Plain Bibbs, Globe,  
 Kerosene, Racking, etc., Cocks,  
 70¢@10¢75¢

**Coffee Mills—See Mills, Coffee.****Collars, Dog—**

Nickel Chain, Walter B. Stevens &  
 Son's list, .... 40¢  
 Leather, Walter B. Stevens & Son list 40¢

**Combs, Curry—**

Metal Stamping Co. .... 40¢

**Mane and Tail—**

Covert's Saddlery Works, .... 60¢@10¢

**Compasses, Dividers, &c.—**

Ordinary Goods, .... 75¢@5¢75¢10¢  
 Bemis & Call Haw. & To. Co.:  
 Dividers, Double ..... 65¢  
 Callipers, Inside or Outside ..... 65¢  
 Callipers, Wing ..... 60¢  
 Compasses ..... 50¢

**Conductor Pipe, Galva—**

L. C. L. to Dealers:  
 Territory. Nested. Not nested.  
 A. Eastern. 75¢@74¢ 75¢@74¢  
 B. Eastern. 75¢@74¢ 75¢@74¢  
 Central. .... 75¢@74¢  
 Southern. .... 70¢@10¢  
 S. Western. .... 70¢@74¢ 70¢@74¢  
 Terms, 60 days, 5% cash, 10 days. Factory  
 shipments generally delivered.

**Coolers, Water—**

Gal, each. 2 3 4 6 8  
 Labrador \$1.90 \$1.50 \$1.80 \$2.10 \$2.70  
 Gal. \$1.80 \$2.10 2.40 3.00 3.60  
 Gal. 2 3 4 6 8  
 Galv. Lined Ea \$1.85 \$2.00 \$2.2 \$2.90 \$3.50  
 25¢  
 Galv. Lined side handles 6 8  
 Gal. 1 2 \$2.15 \$2.40 \$3.50 \$4.15, 25¢

**Coopers' Tools—**

See Tools, Coopers'.

**Cord—Sash—**

Braided, Drab, .... lb. 35¢  
 Braided, White, Com. .... lb. 31¢@29¢  
 Cable Laid Italian, lb. A. 18¢; B. 16¢  
 Common India, .... lb. 10¢@10¢  
 Cotton Sash Cord, Twisted, .... 11¢@11¢  
 Patent Russia, .... lb. 6¢@12¢  
 Cable Laid Russia, .... lb. 6¢@12¢  
 India Hemp, Braided, .... lb. 12¢@14¢  
 India Hemp, Twisted, .... lb. 12¢@14¢  
 Patent India, Twisted, .... lb. 12¢@14¢

Annlston Cordage Co.: Braided Cotton,  
 Old Glory, Nos. 7 to 12, .... 28¢  
 Anniston, Nos. 7 to 12, .... 22¢  
 Old Colour, Nos. 7 to 12, .... 22¢  
 Anniston Drab, Nos. 7 to 12, .... 22¢  
 Pearl Braided, cotton, No. 6, 7, 8, 9, 10,  
 Nos. 7 to 12, 21¢.

Eddystone Braided, Nos. 7, 8, 9 and 10  
 Eddystone Braided Cotton, No. 6, 7, 8, 9,  
 Harmony Cable Laid Italian, No. 7 to  
 10, .... 22¢

Peerless:  
 Cable Laid Italian, .... 16¢  
 Cable Laid Russian, .... 14¢  
 Cable Laid India, .... 12¢  
 Braided India, .... 18¢

Braided, Drab Cotton ..... 36¢@4¢  
 Braided, Italian Hemp, .... 36¢  
 Braided, Linen, .... 36¢  
 Braided, White Cotton or Spot, 36¢  
 Massachusetts, White, .... 36¢  
 Phoenix, White, No. 7 to 12, .... 36¢  
 No. 6 cords, 1 extra, .... 24¢

Silver Lake:  
 A quality, Drab, .... 40¢  
 A quality, White, .... 35¢  
 B quality, Drab, .... 35¢  
 B quality, White, .... 35¢  
 Italian Hemp, .... 40¢  
 Linen, .... 57¢@5¢

Wire, Picture—  
 List Oct., 1900, 85¢@10¢10¢85¢10¢10¢5¢  
 Hendryx Standard Wire Picture Cord, .... 85¢@10¢5¢

**Cradles—**

Grain, .... 60¢@12¢1/2

**Crayons—**

White Round Crayons, gross, 5¢@6¢  
 Cases, 100 gro. \$4.00, a factory.  
 D. M. Stewart Mfg. Co.,  
 Jumbo Crayons, .... gr. \$3.50  
 Metal Workers' Crayons, gr. \$2.50  
 Soapstone Pencils, round, flat  
 or square, .... gr. \$1.50  
 Rolling Mill Crayons, .... gr. \$2.50  
 Railroad Crayons (compo-  
 sition) gr. \$2.00

Zelnicker's Lumber:  
 Red, Blue, Green, .... gr. \$6.50  
 Black, .... gr. \$4.00  
 See also Chalk.

**Crooks, Shepherds—**

Fort Madison, Heavy, .... doz. \$7.00  
 Fort Madison, Light, .... doz. \$6.50

**Crow Bars—See Bars, Crow.****Cultivators—**

Vigor Garden, .... 50¢

**Cutlery, Table—**

International Silver Company:  
 No. 12 Medium Knives, 1917, doz. \$5.50  
 Star, Eagle, Rogers & Hamilton and  
 Anchor, .... doz. \$3.00  
 Wm. Rogers & Son, .... doz. \$2.50

**Cutters—Glass—**

H. B. Mayhew Co., .... 40¢  
 Red Devil, .... 50¢  
 Smith & Hemenway Co., .... 50¢  
 Woodward, .... 40¢

**Meat and Food—**

American ..... 30¢  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12  
 Enterprise, \$5 \$7 \$10 \$25 \$50 \$60  
 Nos. 5 10 15 20 25 30 35 40 45 50  
 Each, \$3 \$3 \$3.75 \$4.50 \$5  
 Dixon's, doz. .... 30¢@10¢40¢  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12  
 Ideal, \$1.00 \$1.75 \$1.90 \$2.00 \$3.00  
 Little Giant, doz. .... 41¢@10¢50¢  
 Nos. 305 310 315 320 325 330 335 340 345 350  
 \$3.00 \$4.00 \$4.40 \$4.80 \$7.00 \$8.00  
 N. E. Foot 1 Chopper, .... 40¢  
 New Triumph No. 605, doz. \$2.00 \$2.10 \$2.20  
 Ruswin Food No. 1, \$2.00; No. 2, \$2.00,  
 45¢@10¢10¢  
 Woodruff's, doz. .... 100 150  
 Nos. .... \$1.00 \$1.50

**Enterprise Beef Shavers—**

Slaw and Kraut—  
 Slaw, Corn Grater, &c. .... 40¢  
 Kraut Cutters 24 x 7, 36 x 8, 30 x 9, 55¢  
 Kraut Cutters 36 x 12, 40 x 13, .... 40¢  
 J. M. Mast Mfg. Co., ..... 40¢  
 Slaw Cutters, 1 Knife, gr. .... 30¢  
 Combined Slaw Cutter and Corn  
 Grater, .... doz. \$4.00

Tucker & Dorsey Mfg. Co.:  
 Kraut Cutters, .... 40¢  
 Slaw Cutters, 1 Knife, gr. .... \$1.50  
 Slaw Cutters, 3 Knife, gr. .... \$2.25@30¢

**Tobacco—**

All Iron, Cheap, .... doz. \$4.25@4.50  
 Enterprise, .... 25¢@5¢  
 National, doz. No. 1, \$2.1; No. 2, \$1.8, 40¢  
 Sargent's, doz. No. 2, .... 60¢  
 Sargent's No. 12 and 11, .... 60¢@10¢

**Washer—**

Appleton's, doz. \$10.00, .... 50¢@10¢10¢

**Diggers, Post Hole, &c.—**

Dalbey Post Hole Auger, per doz. \$9.00  
 Iwan's Improved Post Hole Auger, 40¢@5¢  
 Iwan's Vaughan Pattern Post Hole  
 Auger, doz. .... \$6.25  
 Iwan's Perfection Post Hole Digger, ....  
 doz. \$4.25

Iwan's Split Handle Post Hole Diggers,  
 doz. \$7.25  
 Kohler's Universal, doz. \$15.00  
 Kohler's Little Giant, doz. \$12.00  
 Kohler's Hercules, doz. \$10.00  
 Kohler's Invincible, doz. \$9.00  
 Kohler's Rival, doz. \$8.00  
 Kohler's Pioneer, doz. \$7.00  
 Never-Break Post Hole Diggers, doz. \$7.25  
 \$24.00, .... 40¢  
 Samson, doz. \$34.00, .... 25¢

**Dividers—See Compasses.****Doors Screen—**

Phillips, style E, 7 1/2 in., doz. \$10.50  
 Phillips, style 77, 7 1/2 in., doz. \$8.00  
 Phillips, style x-y, 7 1/2 in., doz. \$11.00

**Drawers, Money—**

Tucker's Pat. Alarm Till No. 1, doz. \$18;  
 No. 2, \$15; No. 3, \$11

**Drawing Knives—**

See Knives, Drawing.

**Dressers, Emery Wheel—**

Diamond Emery Wheel Dressers, .... 35¢  
 Diamond Wheel Dresser Cutter, .... 35¢

**Drills and Drill Stocks—**

Common Blacksmiths' Drill, each  
 \$1.50¢@1.75

Breast, Millers Falls, .... 15¢@10¢  
 Breast, P. S. & W. .... 40¢@5¢  
 Goodell Automatic Drills, 40¢@5¢10¢  
 J. S. A.'s Automatic Drills Nos. 2 and  
 3, .... 10¢@5¢

Johnson's Drill Points, .... 10¢@5¢  
 Millers Falls Automatic Drills, .... 30¢@10¢  
 Ratchet, Curtis & Curtis, .... 25¢  
 Ratchet, Parker's, .... 40¢  
 Ratchet, Weston's, .... 30¢  
 Ratchet, Whitney's, P. S. & W., .... 60¢  
 Whitney's Hand Drill, No. 3, \$10.00;  
 Adjustable, No. 10, \$12.00, .... 35¢@5¢

**Twist Drills—**

Bit Stock, .... 60¢@10¢60¢10¢10¢  
 Taper and Straight Shank  
 60¢@10¢60¢10¢5¢

**Drivers, Screw—**

Screw Driver Bits, per doz. .... 45¢@60¢  
 Bailey's Screw Holder and Driver, doz.  
 2 1/2-inch, \$0; 4-in., \$7.50 6-in., \$9.40  
 Buck Bros' Screw Driver Bits, .... 30¢  
 Champion, .... 50¢  
 Edison, .... 40¢  
 Fray's Hot Hole Sets, No. 3, \$12.00, 50¢  
 Gay's Double Action Ratchet, .... 35¢  
 Goodell's Auto-50¢@10¢10¢50¢10¢10¢5¢  
 Hurwood, .... 40¢  
 Mayhew's Black Handle, .... 40¢  
 Mayhew's Monarch, .... 40¢@10¢  
 Millers Falls, Nos. 20 and 21, .... 25¢@10¢  
 Millers Falls, Nos. 11, 12, 41 42, .... 15¢@10¢  
 Never Turn, .... 60¢  
 New England Specialty Co., .... 50¢  
 Sargent & Co.'s:  
 Nos. 1 and 25, .... 50¢@10¢10¢  
 Nos. 30 and 35, .... 60¢@10¢  
 Nos. 20 and 40, .... 70¢@10¢  
 Smith & Hemenway Co., .... 40¢@5¢  
 H. D. Smith & Co.'s, Perfect Handle, 40¢  
 Stanley & L. L. Co.'s:  
 No. 64, Varnished Handles, 60¢@10¢10¢  
 No. 86, .... 70¢@10¢10¢  
 Swan's:  
 Nos. 65 to 69, .... 50¢  
 No. 40, .... 40¢@10¢  
 Nos. 25, 35 and 45, .... 50¢@10¢10¢

**Eave Trough, Galvanized**

Territory, L. C. L., .... 30¢@10¢  
 A. Eastern, .... 80¢@10¢5¢  
 B. Eastern, .... 80¢@10¢5¢  
 Central, .... 80¢@10¢5¢  
 Southern, .... 75¢@10¢5¢  
 S. Western, .... 75¢@10¢5¢  
 Terms, 2% for cash, factory shipments  
 generally delivered.

**See also Conductor Pipe and Elbows.****Elbows and Shoes—**

Factory shipments, .... 60¢  
 Perfect Elbow (S. S. & Co.), .... 40¢

**Emery, Turkish—**

6 to 6 1/2 6 to 150 Flour  
 Kegs, .... lb. 5¢ 5 1/2 5 3/4 5 1/2  
 1/2 Kegs, .... lb. 5 1/4 5 1/4 5 1/4 5 1/4  
 Kegs, .... lb. 5¢ 5¢ 5¢ 5¢  
 10-lb. cans, 10 in. dia. 5 1/4 7¢ 6¢ 6¢  
 10-lb. cans, less than 10 in. 10¢ 10¢ 8¢  
 Note—In lots 1 or 3 tons a discount of  
 10% is given.

**Extractors, Lemon Juice—**



**Forks—**

Base Discounts Aug. 1, 1893, list:

Hay, 3 tine.....	50c10c5%
Boys' & Fish, 3 tine.....	50c10c5%
Hay & Boys', 3 tine.....	60c5%
Hay & Boys', 4 tine.....	60c5%
Champion Hay.....	60c5%
Hay & Header, long 3 tine.....	8%
Header, 3 tine.....	8%
Barley, 4 & 5 tine, Steel.....	60c2%
Manure, 4 tine.....	60c15c2%
Manure, 5 and 6 tine.....	60c2%
Spading.....	70c2%
Potato Digger, 6 tine.....	60c1%
Sugar Beet.....	40c10%
Coke & Coal.....	40c10%
Heavy Mill & Street.....	60c10%
Iowa Dig-Easy Potato.....	60c10%
Victor, Hay.....	60c15c2%
Victor, Manure.....	60c1%
Victor, Header.....	60c1%
Champion, Hay.....	60c1%
Champion Header.....	60c1%
Champion, Manure.....	60c15c2%
Columbia, Hay.....	60c30%
Columbia, Manure.....	70c
Columbia, Spading.....	70c12%
Haywey Wood Barley.....	40c
W. & C. Potato Digger.....	60c10%
Acme Hay.....	60c2%
Acme Manure 4 tine.....	60c10c2%
Dakota Header.....	60c2%
Jackson Steel Barley.....	60c2%
Kansas Header.....	60c
W. & C. Favorite Wood Barley.....	65%
Plated—See Spoons.....	

**Frames—Saw—**

White, Straight Bar, p-r doz. 75c30c

Red, Straight Bar, per doz \$1.00-1.15

Red Double Brace, per doz \$1.10-1.50

**Freezers Ice Cream—**

Each \$1.25 \$1.60 \$1.90 \$2.20 \$2.50

**Fruit and Jelly Presses—**

See Presses, Fruit and Jelly.

**Fry Pans—See Pans, Fry.****Fuse—**

Per 1000 Feet.

Hemp.....\$2.75

Cotton.....3.20

Waterproof Single Taped.....3.60

Waterproof Double Taped.....4.40

Waterproof Triple Taped.....6.15

**Gates Molasses and Oil—**

Stebbins' Pattern.....8c10c10c10c5%

**Gauges—**

Marking, Mortise, etc.....50c10c5c50c10c10c5%

Chapin-Stephens Co.....40c40c10%

Marking, Mortise, etc.....50c10c10c10c10%

Scholl's Patent.....50c10c10c10c10%

Door Hangers.....35c50c10%

Stanley R. &amp; Co.'s Butt &amp; Babbet.....50c10c10c10c10%

Gauge.....50c10c10c10c10%

Wire, Brown &amp; Sharpe's.....35%

Wire, Morse's.....25%

Wire P. S. &amp; W. Co.....30c10%

**Gliders—Single Cut—**

Nail, Metal, Assorted, gro. \$1.10-1.50

Spike, Metal, Assorted, gro. \$2.20-2.50

Nail, Wood Handled, Assorted, gro. \$1.75-2.00

Spike, Wood Handled, Assorted, gro. \$1.25-1.50

**Class, American Window**

See Trade Report

**Glasses, Level—**

Chapin-Stephens Co.....60c9c10c10%

**Glue—Liquid Fish—**

Bottles or Cans, with Brush.....25c50%

Cans (1/2 pt., pt., qt., 1/2 gal.).....25c18%

International Glue Co. (Martin's).....40c10%

**Grease Axle—**

Common Grade.....gro. \$1.50-2.50

Dixon's Everlasting.....10-15 balls, ea. 50%

Dixon's Everlasting, in box, p doz. 1.00

1.10; 3 doz. 3.00

**Grips, Nipple—**

Perfect Nipple Grips.....40c10c2%

**Griddles, Soapstone—**

Pike Mfg. Co.....35c33c10c10%

**Grindstones—**

Bicycle Emery Grinder.....\$6.50

Bicycle Grindstones, each.....\$2.30-3.00

Pike Mfg. Co.....

Improved Family Grindstones.....per inch, per doz. \$2.00

Pike Mow—Knife and Tool.....30c

Grinder, each.....\$6.00

Velox Ball Bearing, mounted, Angie.....each, \$3.25

Iron Frames.....each, \$3.25

**Halters and Ties—**

Covert Mfg. Co.....

Web.....40c2%

Jute Rope.....40c5c5%

Sisal Rope.....50c

Cotton Rope.....55c2%

Hemp Rope.....55c2%

Covert's Saddlery Works.....

Web and Leather Halters.....70c

Jute and Manila Rope Halters.....70c

Sisal Rope Halters.....60c20%

Jute, Manila and Cotton Rope Ties.....70c

Sisal Rope Ties.....60c10%

**Hammers—**

Handled Hammers—

Heller's Machinists.....40c10c40c10c10%

Heller's Farriers.....40c10c40c10c10%

Magnetite Tack, Nos. 1, 2, 3, \$1.25, \$1.50, \$1.75.....40c40c10c10%

Peck, Stow &amp; Wilcox.....40c10c5%

Fayette R. Plumb.....35c27c30c10c10%

Plumb, A. E. Wall.....35c27c30c10c10%

Engineers' and B. S. Hand.....50c75c50c10c75c10c5%

Machinists' Hammers.....50c50c10c5%

Riveting and Tinnings.....40c35c40c10c5%

Sargent's C. B. New List.....40c

Heavy Hammers and Sledges—

Under 3 lb., per lb., 5c.....50c10c10c35%

\$3 to 5 lb., per lb., 4c.....50c10c10c5%

Over 5 lb., per lb., 30c.....35c10c10%

Wilkinson's Smiths.....94c10c10%

**Handles—****Agricultural Tool Handles—**

Axe, Pick, &c.....	40c50c5%
Hoe, Rake, &c.....	45c50c5%
Fork, Shovel, Spade, &c.....	45c50c5%
Long Handles.....	45c50c5%
D Handles.....	40c

**Cross-Cut Saw Handles—**

Atkins.....	40c5%
Champion.....	45c45c10%
Diston.....	50c

**Mechanics' Tool Handles—**

Auger, assorted.....gro.	\$2.50-2.85
Brad Axl.....gro.	\$1.65-1.85

**Chisel Handles:**

Apple Tanged Firmer, gro. ass'd.....	\$2.10-2.65
Hickory Tanged Firmer, gro. ass'd.....	\$2.15-2.45

**Apple Socket Firmer, gro. ass'd.....**

Hickory Socket Firmer, gro. ass'd.....	\$1.75-1.95
Hickory Socket Framing, gro. ass'd.....	\$1.65-1.85

**File, assorted.....gro. ass'd.....**

Hammer, Hatchet, Axe, &c.....	5%
Hand Saw, Furnished, doz.....	80c-75c
Not Furnished.....	85c-75c

**Plane Handles:**

Jack doz. 30c; Jack Bolted.....	75c
Fore, doz.....	45c; Fore, Bolted 90c

**Chapin-Stephens Co.:**

Chisel.....	40c40c10%
File and Axl.....	65c65c10%
Saw and Plane.....	40c40c10%
Screw Driver.....	40c40c10%

Millers Falls Adj. and Ratchet Auger

Handles.....15c10%

Nicholson Simplicity File Handle.....

per gro.....\$0.85-1.50

**Hangers—**

NOTE—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &amp;c.

**Barn Door, New Pattern, Round**

Groove, Regular:

Inch.....	3 4 5 6 8
Single Doz.....	\$0.90 1.25 1.60 1.95 2.50

**Barn Door, New England Pattern,**

Check Back, Regular:

Inch.....	3 4 5 6
Single Doz.....	\$1.30 1.85 2.50 3.00

Alth Mfg. Co. 1.....per d. z. \$8.00

Reliable No. 2.....per doz. \$9.00

Chicago Spring Bolt Co.:

Friction.....	35%
Oscillating.....	35%
Big win.....	35%

Chisholm &amp; Moore Mfg. Co.:

Baggage Car Door.....	50%
Elevator.....	30%
Railroad.....	50%

Cronk &amp; Carrier Mfg. Co.:

Loose Axle.....	60c10c5%
Roller Bearing.....	70c5%

Griffin Mfg. Co.:

Solid Axle, No. 10, \$12.00.....	70%
Roller Bearing, No. 11, \$15.00.....	70%
Roller Bearing, Ex. W., No. 22.....	\$18.00

Hinged Hange \$16.00.....60c10%

Lawrence Bros.:

Advance.....	40c10%
Cleaveland.....	40c5%
Copper, No. 75.....	80c10%

Easy Parlor Door, Dol. Sets, \$2.50;

Single Sets, \$1.25.

Giant.....60c5%

Hummer.....70c5%

New York.....60c10%

Peerless.....70c5%

Sterling.....60c10%

McKinney Mfg. Co.:

No. 1, Special, \$15.....	60c10%
No. 2, Standard, \$18.....	60c10%

Hinged Hangers, \$16.....50%

Neyers' Station Hangers.....

Pioneer Wood Track No. 3.....\$2.15

Ball R'r'g St. el Track No. 10.....\$2.40

Roller R'r'g Steel Track No. 12.....\$2.30

Ball R'r'g Steel Track No. 13.....\$2.30

Roller R'r'g Steel Track No. 14.....\$2.50

Hero Adjustable Track No. 19.....30%

Adjustable Track Tandem Trol-

ley Track No. 16.....30%

Seal, St-el Track No. 8.....\$2.40

Auto Adjustable Track No. 22, 40x1 1/2

Trolley R. D. No. 17.....\$1.40

Trolley F. D. No. 120.....\$2.35

Trolley F. D. No. 121.....\$2.45

Trolley F. D. No. 151.....\$2.60

Safety Underwriters F. D. No. 101x2.35

Tandem No. 44.....20c5%

Trolley F. D. No. 151.....\$3.00

Palace, Adjustable Track No. 13.....

122.....40c10%

Ires' Wood Track No. 1.....\$2.15

Trolley R. D. No. 20.....\$1.35

Trolley B. D. No. 24.....\$1.45

Trolley B. D. No. 27.....\$1.5

Trolley B. D. No. 38.....\$1.65

Roller Bearings Nos. 39, 40, 41, 42.....

44.....20c5%

Anti-friction No. 42.....60c10%

Hinged Tandem No. 45.....5%

Folding Door B. B. Swivel N. 125, 30%

Safety Door Hanger Co.:

Storm King Hanger.....60%

U. S. Standard Hanger.....60%

Stowell Mfg. and Foundry Co.:

Acme Parlor Ball Bearing.....60%

Ajax Hinge Door.....30%

Apex Parlor Door.....60c10c5%

**Atlas**

Baggage Car Door.....	60c10%
Chimax Anti-Friction.....	50c10%
Elevator.....	40%
Express.....	50%

Freight Car Door.....	60%
Interstate.....	60c10%
Lundy Parlor Door.....	50c10%
Magic.....	60c10%

Matchless.....	60c10%
Nansen.....	70c5%
Par or Door.....	50c10%
Railroad.....	50c10%

Rider Door.....	60%
Street Car Door.....	50%
Steel, Nos. 300, 404, 500.....	50c10%
Underwriters' Flr Door.....	40%

Wild West Warehouse Door.....	5%
Zenith F. Wood Track.....	50c10%

A. L. Swett Iron Works:

Chimax Anti-Friction.....	70%
Eagle.....	50c10%
Hylo Hinge.....	70%

New Perfection.....	60%
Pilot.....	60%
Roller Hinge.....	60%

Weston Wooster.....	60%
Western Pattern.....	60%
Taylor & Boggs F. Y. Co.'s Kipper.....	60%

Roller Bearing.....	50c15c10c5%
Wilcox Mfg. Co.:	

Bike Roller Bearing.....	60c10%
C. J. Roller Bearing.....	60c10%
Rider Bearing.....	60c10%

O. K. Roller Bearing.....	60c10c5%
Prindle, Wood Track.....	60%
Richards' Steel Track.....	50c10%

Spencer Roller Bearing.....	60c10%
Tandem Nos. 1 and 2.....	40%
Underwriters' Roller Bearing.....	40%

Velvet.....	50%
Wilcox New Century Ball Bearing.....	30%
Wilcox Barn Trolley No. 121.....	40%

Wilcox Elv. Door, Nos. 112 and 124.....	30%
Wilcox Elv. Door, No. 132.....	10%
Wilcox Fire Trolley, Roller	

Bearing.....	30%
Wilcox Le Roy Noiseless Ball	
Bearing.....	40%

Wilcox New Century.....	40%
Wilcox O. K. Steel Track.....	50%
Wilcox O. K. Trolley.....	50%

Wilcox Trolley Ball Bearing.....	40%
Wilcox Wideman Narrow Gauge	
Ball Bearing.....	40%

For Track, see Rail

**Hangers, Garment—**

Pullman Trouser, No. 1, p gro.....	\$9.00
Pullman Trouser, No. 4, p gro.....	\$24.00
Victor Folding p gro.....	\$24.00

## Wire Goods Co.

Aome	60¢104
Chief	70¢
Crown	70¢104
Czar	65¢
V Brace	70¢104
Czar Harness	50¢104

## Wrought Iron—

Box, 6 in., per doz.	\$1.00; 8 in., \$1.25;
10 in., \$2.50.	
Cotton	doz. \$1.95@1.25
Wrought Staples, Hooks, &c.	See Wrought Goods.

## Miscellaneous—

Hooks, Bench, see Staps Brnch.	
Bush, Light, doz. \$1.75; Med. \$2.25; Heavy, \$2.75	
Grass	Nos. 1 1.5 2.00
Best	1.50 1.75 2.00
Common	1.30 1.50 1.60
Potato and Manure	60¢15¢
Wh. flint	lb. \$3.40@6¢
Hooks and Eyes	
Brass	60¢10¢10¢10¢
Malleable Iron	70¢5¢70¢10¢
Covert Mfg. Co. Gate and Scuttle Hooks	55¢
Covert Saddlery Works' Self Looking	
Gate and Door Hook	60¢
Ft. Madison Out-Door Iron Hooks	70¢ doz. \$5.35 net
Bench Hooks—See Bench Stops.	
Corn Hooks—See Knives, Corn.	

## Horse Nails—See Nails, Horse

## Horsehoes—

## See Shoes, Horse.

## Hose Rubber—

Garden Hose, 3/4-inch	
Competition	ft. 4 1/2 @ 5 c
3-ply Standard	ft. 6 1/2 @ 7 c
4-ply Standard	ft. 7 1/2 @ 8 c
5-ply Standard	ft. 8 1/2 @ 9 c
4-ply extra	ft. 10 @ 10 1/2 c
Cotton Garden, 3/4-in., coupled	
Low Grade	ft. 6 @ 7 c
Fair quality	ft. 8 @ 9 c

## Irons—Sad—

From 4 to 10	lb. 2 1/4 @ 3 c
B. B. Sad Irons	lb. 3 1/4 @ 3 1/2 c
Chinese Laundry	lb. 4 1/4 @ 5 c
Chinese Sad	lb. 4 1/4 @ 5 c
Mrs. Potts', cents per set	
Nos.	60 65 60 65
Jap. Tops	63 69 72 69
Tin/Tops	65 63 75 72
New England Pressing, lb.	3 1/4 @ 4 c

## Pinking—

Pinking Irons	doz. 50 @ 60 c
Soldering	
Soldering Coppers 2 1/2 and 3	19 @ 20 c
1 1/2 and 2	21 @ 22 c

## Jacks Wagon—

Covert Mfg. Co.	
Auto Screw	30¢5¢
Steel	45¢2¢
Covert's Saddlery Works	60¢10¢
Daly	60¢
Victor	60¢
Lockport	50¢
Lane's Steel	30¢10¢5¢
Richards' Tiger Steel, No. 190	40¢

Kettles—	
Brass, Spun, Plain	20¢25¢
Enamelled and Cast Iron—See Ware, House.	

## Knives—

Butcher, Kitchen, &c.	
Foster Bros' Butcher, &c.	30¢
Smith & Wemuey Co.	40¢10¢
Wilkinson Shear & Cutlery Co.	50¢

## Corn—

Withington Acme, 7 doz.	\$2.05; Dent,
\$2.75; 1 doz. Serrated, \$2.20; Serrated, \$2.10; Yankee No. 1, \$1.50;	
Yankee No. 2, \$1.15.	

## Drawing—

Standard List	70¢10¢75¢10¢
C. E. Jennings & Co. Nos. 45, 46	60¢
Jennings & Griffin, Nos. 41, 42	60¢
Ohio Tool Co.'s	70¢
Swan's	70¢10¢2 1/2 c
Watrous	10¢3¢
L. & J. White	80¢25¢3¢
Iwan's Sickle Edge	70¢ doz. \$9.50
Iwan's Serrated	70¢ doz. \$10.00

## Mining—

Buffalo	70¢ doz. \$13.00
Miscellaneous—	
Farriers	doz. \$3.00@3.55
Woolenhoim's	70¢ doz. \$3.00@3.25

## Knobs—

Base, 2 1/2-inch, Birch, or Maple	
Rubber tip, gro.	\$1.10@1.15
Carriage, Jap. all sizes, doz.	60¢45¢
Door, Mineral	doz. 65¢70¢
Door, Por. Jap. d.	doz. 70¢75¢
Door, Por. Nickel	doz. \$2.00@2.15
Bardley's Wood Door, Shutter, &c.	15¢
Picture, Sargent's	60¢10¢10¢

## Lacing Leather—

See Belting, Leather—	
Ladders, Store &c.	
Lane's	25¢
Myers Noisies—Store Ladders	50¢
Richards Mfg. Co.	
Improve No. 112	40¢
Clifford No. 11, No. 118	40¢
Trolley, No. 108	40¢

## Ladies' Melting—

L. & W. H. Co., Low List	25¢
P. S. & W.	50¢
Reading	60¢
Sargent's	50¢10¢

## Lanterns—

Regular Tubular No. 0, doz.	\$4.35@4.75
Lift Tubular, No. 0, doz.	\$4.75@5.25
Hinge Tubular, No. 0, doz.	\$4.75@5.25
Other Styles	40¢10¢10¢10¢

## Bull's Eye Police—

No. 1 3/4 inch	\$3.50@3.75
No. 2, 3 inch	\$3.75@5.00

## Lasts and Stands Shoe—

Storkell's Atlas, Malleable Iron	50¢
Storkell's Rubber, Cast Iron	50¢
Latches—Thumb—	
Roogin's Latches, W. Therscr, d. 35¢10¢	
1 doz.	10¢
Richards' Bull Dog, Heavy, No. 125	60¢

## Richards' Trump, No. 127

Leaders Cattle—	
Small	doz. 55¢; large, 60¢
Covert Mfg. Co.	50¢

## Lifters, Transom—

R	30¢15¢
Lines—	
Wire Clothes, Nos.	18 19 20
100 feet	\$2.80 2.00 1.65
75 ft.	\$1.80 1.70 1.50

## Samson Cordage Works—

Solid Braided Chalk, No. 0 to 3	40¢
Silver Lake Braided Chalk, No. 0, \$6.00;	
No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50	
Masson's Lines, Shade Cord, &c.	20¢
Cotton No. 3, \$1.50; No. 4, \$2.00; No. 5, \$2.50; Colors, No. 3, \$1.75; No. 4, \$2.25; No. 5, \$2.75; Lines, No. 3, \$2.50; No. 4, \$3.00; No. 5, \$3.50	
Tent and Awning Lines: No. 5, White Cotton, \$1.50; Drab Cotton, \$2.50	
30 ft., \$3.25; 75 ft., \$4.00; 100 ft., \$4.25; 90 ft., \$4.75; 100 ft., \$5.25	
Aniston Waterproof Clothes, 30 ft., \$2.00; 40 ft., \$2.40; 50 ft., \$2.80; 60 ft., \$3.20; 70 ft., \$3.60; 80 ft., \$4.00; 90 ft., \$4.40; 100 ft., \$4.80	
Albion Waterproof Clothes, 30 ft., \$2.00; 40 ft., \$2.40; 50 ft., \$2.80; 60 ft., \$3.20; 70 ft., \$3.60; 80 ft., \$4.00; 90 ft., \$4.40; 100 ft., \$4.80	
Empire, \$14.00; Advance, \$13.50; Oriole, \$13.00; Albion, \$12.50; Eclipse, \$12.50; Chicago, \$11.00; Standard, \$10.50; Columbia, \$8.50; Allston, \$12.50; Calhoun, \$11.00	

## Locks—Cabinet—

Cabinet Locks	33 1/4 @ 33 1/2 @ 34 1/2
Door Locks, Latches, &c.	
[Not prices are very often made on these goods.]	
Reading Hardware Co.	45¢20¢
R. & E. Mfg. Co.	40¢
Sargent & Co.	40¢10¢
Stowell's Steel Door Latches	50¢

## Elevator—

Stowell's	50¢
Padlocks—	
Wrought Iron	70¢10¢5¢30¢5¢
R. & E. Mfg. Co. Wrt. Steel and Brass	75¢15¢10¢

## Sash, &amp;c.—

Ives' Patent	
Bronze and Brass	62 1/2 c
Crescent	50¢10¢
Iron	40¢
Window Ventilating	50¢
Robison Patent Ventilating Sash	
Lock	40¢
Wrought Bronze and Brass	55¢
Wrought Steel	55¢
Pullman Patent Ventilating Lock	55¢
Reading	60¢

## Machines—Boring—

Com. Upright, Without Augers	\$2.00
Com. Angular, Without Augers	\$2.25
R. & E. Mfg. Co., Upright, Angular	
Improved No. 3, \$4.25	No. 1, \$5.00
Improved No. 4, 3.75	No. 2, 3.38
Improved No. 5, 2.75	
Jennings', Nos. 1 and 4	35¢5¢
Miller's Falls	5.75
Snell's, Rice's, &c.	2.50 2.75

## Corking—

## Retzinger Invinible Hand Power—

## Fence—

## Williams Fence Machines—each, \$5.50

## Hoisting—

## Moore's Anti-Friction Differential Pulley Block—each, 30¢

## Moore's Hand Reel, with Lock Brake, 20¢

## Ice Cutting—

## Chandler's—19 1/2 c

## Washing—

## Boss Washing Machine Co., Per doz.

## Champion Rotary Banner No. 1, \$54.00

## Standard Champion No. 1, \$48.00

## Standard Perfection, \$48.00

## Clint Square Western, \$30.00

## Uneda American, Round, \$29.00

## Mallets—

## Hickory—45¢5¢50¢

## Lignumvitae—45¢5¢50¢

## Timbers, Hickory and Applewood, doz. 30¢45¢

## Mangers, Stable—

## Sweet Iron Works—50¢

## Mashers, Vegetable—

## Western, W. G. Co., 60¢10¢

## Mats—Door—

## Elastic Steel (W. G. Co.)—10¢

## Mattocks—

## See Picks and Mattocks.

## Milk Cans—See Cans, Milk

## Mills—Coffee, etc.—

## Enterprise Mfg. Co.—25¢30¢

## National list Jan. 1, 1902—30¢

## Parker's Columbia &amp; Victoria, 50¢10¢60¢

## Parker's Box and Side—50¢10¢60¢

## Swift, Lane Bros. Co.—30¢

## Mowers, Lawn—

## Net prices are generally quoted.

## Cheap—all sizes, \$1.75@7.00

## Good—all sizes, \$2.25@2.50

## 10 12 14 16-inch

## Continental—40¢5¢

## Great American—70¢

## Great American Ball Bearing, new list, 70¢

## Quaker City—70¢

## Pennsylvania—60¢5¢

## Penn. Iron, Jr., Ball Bearing—60¢

## Pennsylvania Gold—50¢

## Pennsylvania Horse—30¢45¢

## Pennsylvania Pony—40¢5¢

## Philadelphia—

## Style M. S. C. K. T.—70¢25¢

## Style A, All Steel—60¢5¢

## Style E, High Wheel—70¢10¢5¢

## Drexel and Gold Coin, low list—40¢5¢

## Nails—

## Wire Nail and Brad, Papered.

## List July 30, 1899—30¢90¢10¢

## Cut and Wire. See Trade Report.

## Hungarian, Finishing, Upholsterers, &amp;c. See Tacks.

## Horse—

## Nos. 6 7 8 9 10

## Anchor 21 30 19 20 40¢5¢

## Champion 25 25 25 24 30 50¢

## Coleman 13 12 12 11 11 net

## Nos. 6 7 8 9 10

New Haven 23 21 20 19 18	40¢5¢
Putnam 23 21 20 19 18	3 1/2 1 1/2
New P'tm 19 18 17 16 15	10¢10¢
Western, per lb	8 1/2 c
Jobbers' special brands, per lb.	8 @ 8 1/2 c

## Picture—

1 1/2 2 2 1/2 3 3 1/2 in.	
Brass Head, 1 1/2 2 2 1/2 3 3 1/2 in.	
Por. Head, 1 1/2 2 2 1/2 3 3 1/2 in.	

## Nippers, See Pliers and Nippers.

## Nuts—

## Cold Punched: Off list.

## Mfrs. or U. S. Standard.

## Square, plain, \$5.10

## Hexagon, plain, \$5.60

## Square, C. T. &amp; R., \$5.30

## Hexagon, C. T. &amp; R., \$6.00

## Hot Pressed:

## Mfrs., U. S. or Nar, Gauge Stan'd.

## Square Blank, \$5.80

## Hexagon Blank, \$5.70

## Square Tapped, \$5.80

## Hexagon Tapped, \$6.30

## Oakum—

## Best or Government, lb. 6 1/2 c

## Navy, lb. 5 c

## U. S. Navy, lb. 6 c

## Plumbers' Spun Oakum, lb. 2 1/2 c

## In carload lots 1/2 lb. off f.o.b. N. York.

## Oil Tanks—See Tanks, Oil.

## Oilers—

## Brass and Copper, 50¢10¢

## Tin or Steel, 65¢10¢

## Zinc, 65¢10¢

## Chas. or Paragon:

## Brass and Copper, 45¢10¢50¢

## Tin or Steel, 65¢10¢

## Zinc, 65¢10¢

## Malleable, Hammer Improved, No. 1, \$5.00; No. 2, \$4; No. 3, \$4.40

## Malleable, Hammer, Old Pattern, same list, 50¢10¢

## American Tube &amp; Stamping Co., Spring Bottom Cans, 70¢10¢10¢

## Railroad Oilers etc., 60¢10¢10¢

## Openers—Can—

## French, doz. 55¢

## Iron Handle, doz. 25¢27¢

## Sprague, Iron Hdl., per doz. 35¢40¢

## Sardine Scissors, doz. \$1.75@5.00

## National, 50¢

## Stowell's Sprague, per doz. 35¢45¢

## Nickel Plate, per doz., \$2.00

## Silver Plate, per doz., \$4.00

## Packing—

## Asbestos Packing, Wick and Rope, 1 1/2 @ 15¢ lb.

## Rubber—

## Sheet, C. I., 8¢10¢

## Sheet, C. O. S., 9¢15¢

## Sheet, C. B. S., 10¢15¢

## Sheet, Pure Gum, 50¢65¢

## Sh. Red, 40¢50¢

## Jenkins' 96, 70¢80¢

## Miscellaneous—

## American Packing, 7¢10¢ lb.

## Cotton Packing, 16¢15¢ lb.

## Italian Packing, 40¢15¢ lb.

## Jute, 40¢15¢ lb.



Stanley's Duplex.....	20@20.10&10%
Woods' Extension.....	39.45
<b>Poachers, Egg—</b>	
Buffalo Steam Egg Poachers, # doz.	No. 1, \$1.10; No. 2, \$1.00; No. 3, \$1.00; No. 4, \$1.20.....
<b>Points, Glaziers—</b>	
Bulk and 1 lb. papers.....	lb. 8 c
1/2-lb. papers.....	lb. 3 3/4 c
1/4-lb. papers.....	lb. 9 3/4 c
<b>Pokes, Animal—</b>	
St. Madison Hawkeye.....	# doz. \$3.25
St. Madison Western.....	# doz. \$3.10
<b>Police Goods—</b>	
Manufacturers' Lists.....	\$5@55&55
Towers.....	25%
<b>Polish—Metal—</b>	
Prestoline Liquid, No. 1 (1/2 pt.), # doz.	\$3.00; No. 2 (1 qt.), \$9.75.....
Prestoline Paste.....	40&10
George William Hoffman:	
U. S. Metal Polish Paste, 3 oz. boxes,	# doz. 50¢; # gr. \$4.50; 1/2 lb. boxes, #
doz. \$1.35; 1 lb. boxes, # doz. \$2.25;	
U. S. Liquid, 8 oz. cans, # doz. \$1.25;	
# gr. \$1.20.....	
Barkeepers' Friend Metal Polish, # doz.	\$1.75; # gr. \$18.00.....
Wynn's White Silk, 1/2 pt. cans, #	doz.....
<b>Stove—</b>	
Black Eagle Benzine Paste, 5 lb. cans	# 10¢
Black Eagle, Liquid, 1/2 pt. cans, # doz.	70¢
Black Jack Paste, 1 lb. cans, # gr. \$9.00;	
Black Kid Paste, 1 lb. cans, # each, \$6.00;	
Ladd's Black Beauty, # \$10.00.....	
Joseph Dixon's, # gr. \$5.75.....	
Dixon's Plumber, # 10¢	
Firestone.....	# gr. \$2.50
Gem, # gr. \$4.50.....	
Japanese.....	# gr. \$3.50
Jet Black.....	# gr. \$3.50
Peerless Iron Enamel, 10 oz. cans.....	# doz. \$1.50
Wynn's:	
Black Silk, 5 lb. pail.....	each 70¢
Black Silk, 1/2 lb. box.....	# doz. \$1.00
Black Silk, 5 oz. box.....	# doz. \$0.75
Black Silk, 1/2 pt. liq.....	# doz. \$1.00
<b>Poppers, Corn—</b>	
1 qt. Square.....	gro. \$9.00
1 qt. Round.....	gro. \$11.00
1 1/2 qt. Square.....	gro. \$11.00
2 qt. Square.....	gro. \$18.00
<b>Post Hole and Tree Augers and Diggers—</b>	
See also Diggers, Post Hole, &c.	
<b>Posts, Steel—</b>	
Steel Fence Posts, each, 5 ft., 4 1/2"; 6	ft., 4 1/2"; 6 ft., 4 1/2".....
Steel Hitching Posts, each.....	\$1.30
<b>Potato Parers—</b>	
See Parers, Potato.	
<b>Pots—Glue—</b>	
Enamelled.....	60%
Tinned.....	50%
<b>Powder—</b>	
In Canisters:	
Duck, 1 lb. each.....	45c
Fine Sporting, 1 lb. each.....	75c
Rifle, 1/2 lb. each.....	15c
Rifle, 1 lb. each.....	25c
King's Semi-Smokeless:	
Keg (25 lb. bulk).....	\$6.50
Half Keg (12 1/2 lb. bulk).....	\$1.50
Quarter Keg (6 1/4 lb. bulk).....	\$1.90
Case 24 (1 lb. cans bulk).....	\$8.50
Half case (1 lb. cans bulk).....	\$4.50
King's Smokeless: Shot Gun	
Keg (25 lb. bulk).....	\$12.00
Half Keg (12 1/2 lb. bulk).....	6.25
Quarter Keg (6 1/4 lb. bulk).....	3.25
Case 24 (1 lb. cans bulk).....	14.00
Half case (1 lb. cans bulk).....	7.25
Robin Hood Smokeless Shot Gun.....	50&20%
<b>Presses—</b>	
Fruit and Jelly—	
Enterprise Mfg. Co.....	30&25%
<b>Seal Presses—</b>	
Morrill's No. 1, per doz. \$20.00.....	50%
<b>Pruning Hooks and Shears—See Shears.</b>	
<b>Pull-rs Cork—</b>	
Invincible Cork Puller.....	\$21.00
<b>Pullers, Nail—</b>	
Cyclops.....	50%
Miller's Falls, No. 3, per doz. \$12.00.....	33&410%
Pearson No. 1, Cyclone Spike Puller,	
each \$30.00.....	50%
Peacock, # doz. \$9.00.....	40&10%
Seranton, Case Lots:	
No. 2 B (large).....	\$5.50
No. 8 B (small).....	\$5.00
Smith & Hemenway Co.: Diamond B. No. 2, ca 10 lbs. # doz. \$8.00	
Diamond B. No. 3, case lots # doz. \$5.50	
Glan No. 1, # doz. \$18; No. 2, \$10.50;	
No. 3, \$15.....	40%
<b>Pulleys—Single Wheel—</b>	
Inch.....	2 1/2 5
Awning, # doz. \$9.55	25 1.15
Hay Fork, Siverlor or Solid Eye.....	doz., 4 in. \$1.15; 5 in., \$1.40
Inch.....	2 1/4 2 1/2
Hot House, # doz. \$0.70	1.25
Inch.....	1 1/4 1 1/2 1 3/4
Src. w., # doz. \$0.15	.19 .30
Inch.....	1 1/2 2 1/4 2 1/2
Side.....	doz. \$0.30 .40 .50 .65
Inch.....	1 1/4 1 1/2 2 1/4
Tackle.....	doz. \$0.30 .45 .58 1.00
Stowells:	
Ceiling or End, Anti-Friction.....	60&10%
Drum & Walter, Anti-Friction.....	60&10%
Electric Light.....	60%
Slide Anti-Friction.....	50&10%
<b>Sash Pulleys—</b>	
Common Frame; square or Round	
End, per doz., 1 1/4 and 2 in., 1 1/2 and 1 3/4	
Auger Mortise, no Face Plate, per	
doz., 1 1/4 and 2 in.....	1 1/2@1 3/4

<b>Auger Mortise, with Face Plate, per</b>	<b>doz., 1 1/4 and 2 in.....</b>	<b>1 1/2@1 3/4</b>
<b>Acme.....</b>	<b>1 1/4 in. 1 1/2; 2 in. 1 1/2</b>	<b>1 1/2</b>
<b>Fox-All-Steel, Nos. 3 and 7 2 in. # doz</b>	<b>50%</b>	
<b>Grand Rapids All Steel Noiseless.....</b>	<b>50%</b>	
<b>Ideal.....</b>	<b>70&amp;10%</b>	
<b>Ningara.....</b>	<b>1 1/4 in. 1 1/2; 2 in. 1 1/2</b>	<b>1 1/2</b>
<b>No. 26, Troy.....</b>	<b>1 1/4 in. 1 1/2; 2 in. 1 1/2</b>	<b>1 1/2</b>
<b>Star.....</b>	<b>1 1/4 in. 1 1/2; 2 in. 1 1/2</b>	<b>1 1/2</b>
<b>Tackle Blocks—See Blocks.</b>		
<b>Pumps—</b>		
Cistern.....	60&5 10%	
Pitcher Spout.....	50@50 10%	
Wood pumps Tubing, Etc.....	45&50%	
Barnes Dbl. Acting (low list).....	50&10%	
Barnes' 1 1/2 ch. 8000.....	50%	
Contractors' Rubber Diaphragm, N. 3		
H. & L. Block Co.....	\$18.00	
Daisy Spray Pump.....	# doz. \$7.30	
Flint & Walling's, Fast Mail Hand,		
(Low list).....	55%	
Flint & Walling's Fast Mail (low list).....	55%	
Flint & Walling's Tight Top Pitcher.....	55&55	
National Specialty Mfg. Co., measuring		
inches.....	30%	
Mechanical Sprayer.....	\$7.20	
Myer's Pumps, low list.....	50%	
Myer's Power Pumps.....	50%	
Myer's Spray Pumps.....	50%	
<b>Pump Leathers—</b>		
Plunger and Lower Valve—Per gro.:		
Inch.....	2 2 1/4 2 1/2 2 3/4	3 3 1/4 3 1/2
Inch.....	3 3 1/4 3 1/2 3 3/4	4 4 1/4 4 1/2
Plunger Cup Leathers—Per 100:		
Inch.....	2 1/4 3 3 1/4 4	
Inch.....	\$2.75 3 3 1/2 5.00 6.00	
<b>Punches—</b>		
Saddlers' or Drive, good, # doz. 50@75c		
Spring, single tube, good quality.....	\$1.75@2.00	
Revolving (tubes).....	doz. \$3.50@3.75	
Bemis & Call Co.'s Cast Steel Drive.....	50%	
Bemis & Call Co.'s Check.....	55%	
Morrill's No. 1 (A.B.C.) # doz. \$15.00.....	50%	
No. 2, # doz. \$22.50.....	50%	
Hercules, each \$7.50.....	50%	
Niagara Hollow Punches.....	40%	
Niagara Solid Punches.....	55&10%	
Steel Screw, B. & K. Mfg. Co.....	50%	
Tinners' Hollow, P. S. & W. Co. \$3.50@5.25		
Tinners' Solid, P. S. & W. Co., # doz.		
\$1.44.....	60%	
<b>Rail—</b>		
Barn Door, &c.—		
Cast Iron, Barn Door: Flange Ser. w.		
Holes for Rd. Groove Wheels:		
1/2 3/4 1 1/2 1 3/4 2 1/2 3 1/2 4 1/2		
\$1.70 \$2.10 \$3.00 \$3.00 100 feet		
Angular for Sq. Groove Wheels:		
Small. Med. Large.		
\$1.50 1.90 2.90 100 feet.		
Sliding Door, Iron Painted.....	24&24 1/2	
Sliding Door, Wrought Brass, 1 1/2		
in.....	lb. 36c.....	30%
Allith Mfg. Co.:		
No. 1, Reliable Hanger Track, # ft. 5 1/2		
No. 2, Reliable Hanger Track, # ft. 7 1/2		
Crown.....		
Double Braced Steel Rail, # foot.....	3c	
O. N. T. Rail.....	24&24 1/2	
Griffin's:		
xxx per 100 ft., 1 x 3-16 in., \$3.00; 1 1/4 x		
3-16 in., \$3.50.....		
Hinged Hanger, per 100 ft. 1 x 3-16 in.,		
\$3.10; 1 1/4 x 3-16 in., \$4.00.....		
Lane's:		
Hinged Track, # 100 ft., 1 in., \$3.70;		
1 1/4 in. \$4.40.....		
O. N. T., # 100 ft., 1 in., \$2.75; 1 1/4		
inch, \$3.50; 1 1/4 inch \$4.00.....		
Standard, 1 1/4 in., # 100 ft.....	4.00	
Lawrence Bros.:		
# 100 ft. No. 201, \$4.00; No. 202, \$4.40		
New York, 1 x 3-16 in., # 100 ft. \$2.75		
McKinney's:		
Hinged Hanger Rail # foot, 1 1/2.....	50%	
None 1-1/2.....	# ft. 34c	
Standard.....	# ft. 4 c	
Myer's stayeron Track.....	60%	
Richards Mfg. Co.:		
Common 1 x 3-16, \$2.75; 1 1/4 x 3-16, \$3.25;		
1 1/4 x 3-16, \$3.50.....		
Special Hinged Hanger Rail.....	\$4.40	
Fire Door Track, # ft. 2 x 3 1/2 1 1/2;		
3 1/2 x 3 1/2.....	40%	
1 1/2 x 3 1/2, No. 65.....	40%	
Gauge Trolley Track, # ft. No. 31, 104;		
No. 32, 156; No. 33, 24c.....		
Safety Door Hanger Co.'s Storm King		
Safety.....	60%	
Safety Door Hanger Co.'s U.S. Standard		
Safety.....	60%	
Stowell's:		
Cast Rail.....	# ft. 1 1/2 c	
Steel Rail, Plain.....	25%	
Wrought Bracket, 1 1/4-16 in.....	# ft. 8c	
Wrought bracket, 1 1/4-16 in.....	# ft. 7c	
Sweet's Hylor, per ft. 1 1/2.....	60%	
P. L. B. Steel Rail, # 100 ft.....	\$3.00	
No. 1, 1 x 3-16, # 100 ft.....	\$2.75	
<b>Rakes—</b>		
Net Prices, Malleable Rakes:		
10 12 14 16-tooth		
Shant.....	\$1.50 1.60 1.75 1.85	
Socket.....	\$1.65 1.70 1.95 2.10	
Steel, Garden and Gravel, Aug. 1,		
190 List.....	70%	
Weldless Steel.....	75&5%	
Malleable Iron, Garden.....	70&10%	
Lawn Rake, Metal Head, per doz.		
20 teeth.....	\$3.25@3.50	
2 1/2 ft. w.....	\$3.50@3.75	
Fort Madison Red Head Lawn.....	\$2.20	
Fort Madison Blue Head Lawn.....	\$2.70	
Jackson Lawn, 20 and 30 teeth, # doz.		
net. \$4.25.....		
Kohler's:		
Lawn Queen, 20-tooth, # doz.....	\$3.45	
Lawn Queen, 24-tooth, # doz.....	\$3.80	
Paragon 20-tooth, # doz.....	\$2.75	
Paragon 24-tooth, # doz.....	\$3.00	
Steel Garden, 14-tooth, # doz.....	\$2.38	
Malleable Garden, 14-tooth, # doz.....	\$1.75@2.00	
<b>Rasps, Horse—</b>		
Diston's.....	75%	
Reiter Bros.....	70&50 10&5%	
McCaffrey's American Standard.....	70&10%	
New Nicholson.....	10&10 10&75%	
See also Files.		

<b>Razors—</b>		
Boracic.....		60%
Fox Razors, No. 42.....	# doz. \$20.00	
Fox Razors, No. 44.....	# doz. \$20.00	
Fox Razors, No. 82, Platina, # doz.		
All other Razors.....		40%
Red Devil.....		60%
Silberstein.....		60%
Carbo Magnetic.....	\$18.00	
Griffon, No. 65.....	\$15.00	
Griffon, No. 66.....	\$12.00	
All other Razors.....		40%
<b>Safety Razors—</b>		
Silberstein.....		40%
<b>Reels— Fishing—</b>		
Headryx:		
M. 6, Q. 6, A. 6, B. 6, M. 6, M. 14, Q. 14,		
A. 16, B. 16, 4005, Rubber Popul.....		20%
N. Keled Popul.....		20%
Aluminum, German Silver, Bronze.....		25%
1240 N. 124 N.....		20%
3001 N. 96 N. 6 RM. G. D.....		25%
4 N. 5 PN, 24 N. 26 PN.....		20%
2004 P.....		33 1/2 c
2004 P.....		33 1/2 c
0924 N.....		33 1/2 c
02084 N.....		33 1/2 c
002004 N.....		33 1/2 c
872 N.....		33 1/2 c
984 PN, 2004 N. 974 PN.....		25%
5009 P. 1, 5009 N.....		20%
Comptometer, 102 P. 102 PN, 202 P.		
202 PN, 102 PR, 202 PR.....		25%
304 P, 304 P. 1, 00304 P, 00304 PN.....		33 1/2 c
<b>Registers—List July 1, 1903.</b>		
Black Jap.....		75&76 10
White Jap.....		75&76 10
Bronzed.....		75&76 10
Nickel Plated.....		75&76 10
Electro Plated.....		75&76 10
<b>Revolvers—</b>		
Single Action.....		85@90c
Double Act. n. except 1/2 cal.....		\$1.30
Double Action, 1/2 caliber.....		\$2.05
Automatic.....		\$3.60
Hammerless.....		\$4.10
Note.—Jobbers frequently cut the above prices of manufacturers for small trade.		
<b>Riddles, Hardware Grade—</b>		
16 in., per doz.....		\$2.50@2.50
17 in., per doz.....		\$2.50@2.75
18 in., per doz.....		\$2.75@3.00
<b>Rings and Ringers—</b>		
<b>Bull Rings—</b>		
Steel.....	\$0.70	2 1/2 3 1/2 4 1/2 5 1/2 6 1/2 7 1/2 8 1/2 9 1/2 10 1/2 11 1/2 12 1/2 13 1/2 14 1/2 15 1/2 16 1/2 17 1/2 18 1/2 19 1/2 20 1/2 21 1/2 22 1/2 23 1/2 24 1/2 25 1/2 26 1/2 27 1/2 28 1/2 29 1/2 30 1/2 31 1/2 32 1/2 33 1/2 34 1/2 35 1/2 36 1/2 37 1/2 38 1/2 39 1/2 40 1/2 41 1/2 42 1/2 43 1/2 44 1/2 45 1/2 46 1/2 47 1/2 48 1/2 49 1/2 50 1/2 51 1/2 52 1/2 53 1/2 54 1/2 55 1/2 56 1/2 57 1/2 58 1/2 59 1/2 60 1/2 61 1/2 62 1/2 63 1/2 64 1/2 65 1/2 66 1/2 67 1/2 68 1/2 69 1/2 70 1/2 71 1/2 72 1/2 73 1/2 74 1/2 75 1/2 76 1/2 77 1/2 78 1/2 79 1/2 80 1/2 81 1/2 82 1/2 83 1/2 84 1/2 85 1/2 86 1/2 87 1/2 88 1/2 89 1/2 90 1/2 91 1/2 92 1/2 93 1/2 94 1/2 95 1/2 96 1/2 97 1/2 98 1/2 99 1/2 100 1/2 101 1/2 102 1/2 103 1/2 104 1/2 105 1/2 106 1/2 107 1/2 108 1/2 109 1/2 110 1/2 111 1/2 112 1/2 113 1/2 114 1/2 115 1/2 116 1/2 117 1/2 118 1/2 119 1/2 120 1/2 121 1/2 122 1/2 123 1/2 124 1/2 125 1/2 126 1/2 127 1/2 128 1/2 129 1/2 130 1/2 131 1/2 132 1/2 133 1/2 134 1/2 135 1/2 136 1/2 137 1/2 138 1/2 139 1/2 140 1/2 141 1/2 142 1/2 143 1/2 144 1/2 145 1/2 146 1/2 147 1/2 148 1/2 149 1/2 150 1/2 151 1/2 152 1/2 153 1/2 154 1/2 155 1/2 156 1/2 157 1/2 158 1/2 159 1/2 160 1/2 161 1/2 162 1/2 163 1/2 164 1/2 165 1/2 166 1/2 167 1/2 168 1/2 169 1/2 170 1/2 171 1/2 172 1/2 173 1/2 174 1/2 175 1/2 176 1/2 177 1/2 178 1/2 179 1/2 180 1/2 181 1/2 182 1/2 183 1/2 184 1/2 185 1/2 186 1/2 187 1/2 188 1/2 189 1/2 190 1/2 191 1/2 192 1/2 193 1/2 194 1/2 195 1/2 196 1/2 197 1/2 198 1/2 199 1/2 200 1/2 201 1/2 202 1/2 203 1/2 204 1/2 205 1/2 206 1/2 207 1/2 208 1/2 209 1/2 210 1/2 211 1/2 212 1/2 213 1/2 214 1/2 215 1/2 216 1/2 217 1/2 218 1/2 219 1/2 220 1/2 221 1/2 222 1/2 223 1/2 224 1/2 225 1/2 226 1/2 227 1/2 228 1/2 229 1/2 230 1/2 231 1/2 232 1/2 233 1/2 234 1/2 235 1/2 236 1/2 237 1/2 238 1/2 239 1/2 240 1/2 241 1/2 242 1/2 243 1/2 244 1/2 245 1/2 246 1/2 247 1/2 248 1/2 249 1/2 250 1/2 251 1/2 252 1/2 253 1/2 254 1/2 255 1/2 256 1/2 257 1/2 258 1/2 259 1/2 260 1/2 261 1/2 262 1/2 263 1/2 264 1/2 265 1/2 266 1/2 267 1/2 268 1/2 269 1/2 270 1/2 271 1/2 272 1/2

**Screws—Bench and Hand—**

Bench, Iron, doz. 1 in. \$2.50 to \$2.75  
 1 1/2, \$3.00 to \$3.25  
 2, \$3.50 to \$3.75  
 3, \$4.00 to \$4.25  
 4, \$4.50 to \$4.75  
 5, \$5.00 to \$5.25  
 6, \$5.50 to \$5.75  
 8, \$6.00 to \$6.25  
 10, \$6.50 to \$6.75  
 12, \$7.00 to \$7.25  
 14, \$7.50 to \$7.75  
 16, \$8.00 to \$8.25  
 18, \$8.50 to \$8.75  
 20, \$9.00 to \$9.25  
 24, \$9.50 to \$9.75  
 30, \$10.00 to \$10.25  
 36, \$10.50 to \$10.75  
 48, \$11.00 to \$11.25  
 60, \$11.50 to \$11.75  
 72, \$12.00 to \$12.25  
 96, \$12.50 to \$12.75  
 120, \$13.00 to \$13.25  
 144, \$13.50 to \$13.75  
 168, \$14.00 to \$14.25  
 192, \$14.50 to \$14.75  
 216, \$15.00 to \$15.25  
 240, \$15.50 to \$15.75  
 264, \$16.00 to \$16.25  
 288, \$16.50 to \$16.75  
 312, \$17.00 to \$17.25  
 336, \$17.50 to \$17.75  
 360, \$18.00 to \$18.25  
 384, \$18.50 to \$18.75  
 408, \$19.00 to \$19.25  
 432, \$19.50 to \$19.75  
 456, \$20.00 to \$20.25  
 480, \$20.50 to \$20.75  
 504, \$21.00 to \$21.25  
 528, \$21.50 to \$21.75  
 552, \$22.00 to \$22.25  
 576, \$22.50 to \$22.75  
 600, \$23.00 to \$23.25  
 624, \$23.50 to \$23.75  
 648, \$24.00 to \$24.25  
 672, \$24.50 to \$24.75  
 696, \$25.00 to \$25.25  
 720, \$25.50 to \$25.75  
 744, \$26.00 to \$26.25  
 768, \$26.50 to \$26.75  
 792, \$27.00 to \$27.25  
 816, \$27.50 to \$27.75  
 840, \$28.00 to \$28.25  
 864, \$28.50 to \$28.75  
 888, \$29.00 to \$29.25  
 912, \$29.50 to \$29.75  
 936, \$30.00 to \$30.25  
 960, \$30.50 to \$30.75  
 984, \$31.00 to \$31.25  
 1008, \$31.50 to \$31.75  
 1032, \$32.00 to \$32.25  
 1056, \$32.50 to \$32.75  
 1080, \$33.00 to \$33.25  
 1104, \$33.50 to \$33.75  
 1128, \$34.00 to \$34.25  
 1152, \$34.50 to \$34.75  
 1176, \$35.00 to \$35.25  
 1200, \$35.50 to \$35.75  
 1224, \$36.00 to \$36.25  
 1248, \$36.50 to \$36.75  
 1272, \$37.00 to \$37.25  
 1296, \$37.50 to \$37.75  
 1320, \$38.00 to \$38.25  
 1344, \$38.50 to \$38.75  
 1368, \$39.00 to \$39.25  
 1392, \$39.50 to \$39.75  
 1416, \$40.00 to \$40.25  
 1440, \$40.50 to \$40.75  
 1464, \$41.00 to \$41.25  
 1488, \$41.50 to \$41.75  
 1512, \$42.00 to \$42.25  
 1536, \$42.50 to \$42.75  
 1560, \$43.00 to \$43.25  
 1584, \$43.50 to \$43.75  
 1608, \$44.00 to \$44.25  
 1632, \$44.50 to \$44.75  
 1656, \$45.00 to \$45.25  
 1680, \$45.50 to \$45.75  
 1704, \$46.00 to \$46.25  
 1728, \$46.50 to \$46.75  
 1752, \$47.00 to \$47.25  
 1776, \$47.50 to \$47.75  
 1800, \$48.00 to \$48.25  
 1824, \$48.50 to \$48.75  
 1848, \$49.00 to \$49.25  
 1872, \$49.50 to \$49.75  
 1896, \$50.00 to \$50.25  
 1920, \$50.50 to \$50.75  
 1944, \$51.00 to \$51.25  
 1968, \$51.50 to \$51.75  
 1992, \$52.00 to \$52.25  
 2016, \$52.50 to \$52.75  
 2040, \$53.00 to \$53.25  
 2064, \$53.50 to \$53.75  
 2088, \$54.00 to \$54.25  
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 2136, \$55.00 to \$55.25  
 2160, \$55.50 to \$55.75  
 2184, \$56.00 to \$56.25  
 2208, \$56.50 to \$56.75  
 2232, \$57.00 to \$57.25  
 2256, \$57.50 to \$57.75  
 2280, \$58.00 to \$58.25  
 2304, \$58.50 to \$58.75  
 2328, \$59.00 to \$59.25  
 2352, \$59.50 to \$59.75  
 2376, \$60.00 to \$60.25  
 2400, \$60.50 to \$60.75  
 2424, \$61.00 to \$61.25  
 2448, \$61.50 to \$61.75  
 2472, \$62.00 to \$62.25  
 2496, \$62.50 to \$62.75  
 2520, \$63.00 to \$63.25  
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 2616, \$65.00 to \$65.25  
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 2688, \$66.50 to \$66.75  
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 2736, \$67.50 to \$67.75  
 2760, \$68.00 to \$68.25  
 2784, \$68.50 to \$68.75  
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 2832, \$69.50 to \$69.75  
 2856, \$70.00 to \$70.25  
 2880, \$70.50 to \$70.75  
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 2928, \$71.50 to \$71.75  
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 3264, \$78.50 to \$78.75  
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 3312, \$79.50 to \$79.75  
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 3360, \$80.50 to \$80.75  
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 3672, \$87.00 to \$87.25  
 3696, \$87.50 to \$87.75  
 3720, \$88.00 to \$88.25  
 3744, \$88.50 to \$88.75  
 3768, \$89.00 to \$89.25  
 3792, \$89.50 to \$89.75  
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 4128, \$96.50 to \$96.75  
 4152, \$97.00 to \$97.25  
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 4272, \$99.50 to \$99.75  
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 5640, \$128.00 to \$128.25  
 5664, \$128.50 to \$128.75  
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 5760, \$130.50 to \$130.75  
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 5808, \$131.50 to \$131.75  
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 5928, \$134.00 to \$134.25  
 5952, \$134.50 to \$134.75  
 5976, \$135.00 to \$135.25  
 6000, \$135.50 to \$135.75  
 6024, \$136.00 to \$136.25  
 6048, \$136.50 to \$136.75  
 6072, \$137.00 to \$137.25  
 6096, \$137.50 to \$137.75  
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 6144, \$138.50 to \$138.75  
 6168, \$139.00 to \$139.25  
 6192, \$139.50 to \$139.75  
 6216, \$140.00 to \$140.25  
 6240, \$140.50 to \$140.75  
 6264, \$141.00 to \$141.25  
 6288, \$141.50 to \$141.75  
 6312, \$142.00 to \$142.25  
 6336, \$142.50 to \$142.75  
 6360, \$143.00 to \$143.25  
 6384, \$143.50 to \$143.75  
 6408, \$144.00 to \$144.25  
 6432, \$144.50 to \$144.75  
 6456, \$145.00 to \$145.25  
 6480, \$145.50 to \$145.75  
 6504, \$146.00 to \$146.25  
 6528, \$146.50 to \$146.75  
 6552, \$147.00 to \$147.25  
 6576, \$147.50 to \$147.75  
 6600, \$148.00 to \$148.25  
 6624, \$148.50 to \$148.75  
 6648, \$149.00 to \$149.25  
 6672, \$149.50 to \$149.75  
 6696, \$150.00 to \$150.25  
 6720, \$150.50 to \$150.75  
 6744, \$151.00 to \$151.25  
 6768, \$151.50 to \$151.75  
 6792, \$152.00 to \$152.25  
 6816, \$152.50 to \$152.75  
 6840, \$153.00 to \$153.25  
 6864, \$153.50 to \$153.75  
 6888, \$154.00 to \$154.25  
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 7152, \$159.50 to \$159.75  
 7176, \$160.00 to \$160.25  
 7200, \$160.50 to \$160.75  
 7224, \$161.00 to \$161.25  
 7248, \$161.50 to \$161.75  
 7272, \$162.00 to \$162.25  
 7296, \$162.50 to \$162.75  
 7320, \$163.00 to \$163.25  
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 7392, \$164.50 to \$164.75  
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 7776, \$172.50 to \$172.75  
 7800, \$173.00 to \$173.25  
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 7872, \$174.50 to \$174.75  
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 7968, \$176.50 to \$176.75  
 7992, \$177.00 to \$177.25  
 8016, \$177.50 to \$177.75  
 8040, \$178.00 to \$178.25  
 8064, \$178.50 to \$178.75  
 8088, \$179.00 to \$179.25  
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 8160, \$180.50 to \$180.75  
 8184, \$181.00 to \$181.25  
 8208, \$181.50 to \$181.75  
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 9072, \$199.50 to \$199.75  
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 9144, \$201.00 to \$201.25  
 9168, \$201.50 to \$201.75  
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 9216, \$202.50 to \$202.75  
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 9480, \$208.00 to \$208.25  
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 10152, \$222.00 to \$222.25  
 10176, \$222.50 to \$222.75  
 10200, \$223.00 to \$223.25  
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 11664, \$253.50 to \$253.75  
 11688, \$254.00 to \$254.25  
 11712, \$



**Tools—Coopers'—**

L. & L. J. White	300@200.50
<b>Hay—</b>	
Myers' Hay Tools	300
Stowell's Hay Carriers	50
Stowell's Hay Forks	50
Stowell's Fork Pulleys	50

**Saw—**

Atkins' Cross Cut Saw Tools	400
Simonds' Improved	334.5
Simonds' Crescent	255

**Ship—**

L. & L. J. White	255
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**Transom Lifters—**

See Lifters, Transom.

**Traps—Fly—**

Balkoon, Globe or Acme	doz. \$1.15 @ 1.25; gro. \$11.50 @ 12.00
Harper, Champion or Paragon	doz. \$1.25 @ 1.50; gro. \$13.00 @ 13.50

**Game—**

Oneida Pattern	75¢ @ 1.00 @ 1.25 @ 1.50
Newhouse	45¢ @ 45¢ @ 55¢
Hawley & Norton	65¢ @ 65¢ @ 75¢
Victor (Oneida Pattern)	75¢ @ 75¢ @ 85¢
O. G. Jump (Blake Pattern)	60¢ @ 60¢ @ 1.00

**Mouse and Rat—**

Mouse, Wood, Choker, doz. holes	8 1/2 @ 90
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Mouse, Round or Square Wire	doz. 85 @ 90
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Marty French Rat and Mouse Traps (Genuine)	doz. \$1.12 @ 1.25; case of 50 \$5.25 @ 5.50
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No. 3 1/2, Rat, 7 doz. \$1.75; case of 72 \$1.25 @ 1.50	
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No. 4, Mouse, 7 doz. \$3.50; case of 7 \$4.75 @ 5.00	
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No. 5, Mouse, 7 doz. \$2.75; case of 150 \$2.35	
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**Trimmers Spoke—**

Wood's K.I.	300
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**Trowels—**

Dixton Brick and Pointing	300
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Dixton Plastering	350
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Dixton "Standard Brand" and Garden Trowels	350
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Kohler's Steel Garden Trowels, 5 in.	\$1.00 @ 1.50
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Kohler's Steel Garden Trowels, 6 in.	\$1.00 @ 1.50
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Never-Break Steel Garden Trowels	gro. \$0.10
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Rose Brick and Plastering	350
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Woodrough & McFarlin, Plastering	250
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**Trucks, Warehouse, &c.—**

B. & L. Block Co.	50¢ @ 1.00
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New York Pattern	50¢ @ 1.00
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Western Pattern	60¢ @ 1.00
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Handy Trucks	per doz. \$16.00
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Grocery "Standard Brand" and Garden	per doz. \$15.00
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Daisy Stove Trucks, Improved Pattern	doz. \$18.50
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Model Stove Trucks	doz. \$18.50
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**Tubs, Wash—**

No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	
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Galvanized Wash Tubs (S. & C. Co.)	No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100
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Per doz., net \$3.70 6.50 7.30 8.30 9.30 10.30 11.30 12.30 13.30 14.30 15.30 16.30 17.30 18.30 19.30 20.30 21.30 22.30 23.30 24.30 25.30 26.30 27.30 28.30 29.30 30.30 31.30 32.30 33.30 34.30 35.30 36.30 37.30 38.30 39.30 40.30 41.30 42.30 43.30 44.30 45.30 46.30 47.30 48.30 49.30 50.30 51.30 52.30 53.30 54.30 55.30 56.30 57.30 58.30 59.30 60.30 61.30 62.30 63.30 64.30 65.30 66.30 67.30 68.30 69.30 70.30 71.30 72.30 73.30 74.30 75.30 76.30 77.30 78.30 79.30 80.30 81.30 82.30 83.30 84.30 85.30 86.30 87.30 88.30 89.30 90.30 91.30 92.30 93.30 94.30 95.30 96.30 97.30 98.30 99.30 100.30	
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**Twine—Miscellaneous—**

Flax Twine—BC B.	
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No. 9, 10 and 1/2-lb. Balls	30¢ @ 40
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No. 11, 12 and 1/2-lb. Balls	30¢ @ 40
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No. 13, 14 and 1/2-lb. Balls	30¢ @ 40
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No. 15, 16 and 1/2-lb. Balls	30¢ @ 40
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No. 17, 18 and 1/2-lb. Balls	30¢ @ 40
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No. 19, 20 and 1/2-lb. Balls	30¢ @ 40
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Chalk Line, Cotton, 1/2-lb. Balls	30¢ @ 40
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Cotton Mops, 6, 9, 12 and 15 in. to doz.	9 @ 110
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Cotton Wrapping 5 Balls to lb. according to quality	12¢ @ 20
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American 2-Ply Hemp, 1/4 and 1/2-lb. Balls	15¢ @ 110
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**American 3-Ply Hemp, 1-lb. Balls**

India 2-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine)	70¢ @ 100
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India 3-Ply Hemp, 1-lb. Balls	70¢ @ 100
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India 3-Ply Hemp, 1/4-lb. Balls	60¢ @ 100
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2, 3, 4 and 5-Ply Jute, 1/4-lb. Balls	50¢ @ 100
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Mason Line, Linen, 1/4-lb. Balls	100
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No. 264 Mattress, 1/4 and 1 1/2-lb. Balls	370
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Wool, 3 to 6 ply	5 1/2 @ 60
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**Vises—**

Solid Box	50¢ @ 100
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**Parallel—**

Athol Machine Co.	
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Simpson's Adjustable	400
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Standard	400
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Amateur	350
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Columbian Hdw Co.	400
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Emmert Universal	
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Pattern Makers' No. 1 \$15.00; No. 2 \$12.50; No. 3 \$10.00	
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Machinists' and Tool Makers' No. 4 \$12.50; No. 5 \$7.00; No. 6 \$10.00; No. 10 \$21.50	
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Jewelers' No. 7	\$4.00
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Fisher & Norris Double Screw	15¢ @ 100
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Holland's	
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Perfect	40¢ @ 100
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Key tone	65¢ @ 70
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Lewis Tool Co.	20¢ @ 30
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Merrill's	200
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Miller's Falls	60¢ @ 100
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Mansey Vice Co.	
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Clinch	400
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Perfect	300
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Lightning Grip	200
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Parker's	
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Victor	20¢ @ 25
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Regular	20¢ @ 25
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Vulcan's	40¢ @ 45
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Combination Pipe	50¢ @ 60
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Prentiss	20¢ @ 25
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Sargent's	400
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Smith & Hemenway Co.	
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Machinists	400
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Jewelers	300
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Snediker's X. L.	300
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Stephens	300
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**Saw Filers—**

Dixton's D 3 Clamp and Guide, 7 doz.	\$30
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Perfection Saw Clamps, 7 doz.	\$5.00
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Reading	600
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Wentworth's Rubber Jaw, Nos. 1, 2 and 3	15¢ @ 50
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**Wood Workers—**

Lightning Grip	150
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Perfect	150
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Wyman & Gordon's Quick Action, 6 in., \$0.00; 9 in., \$7.00; 14 in., \$8.00	
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**Miscellaneous—**

Signal & Keeler Combination Pipe	60¢ @ 100
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Holland's Combination Pipe	60¢ @ 65
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Mansey's Quick Action Pipe	400
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Parker's Combination Pipe	
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87 Series	800
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187 Series	800
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No. 870	400
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Wads—Price Per M.	
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B. E. 11 up	600
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B. E. 9 and 10	700
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B. E. 7	800
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B. E. 5	900
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P. E. 11 up	\$1.00
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P. E. 9 and 10	1.25
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P. E. 8	1.50
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P. E. 7	1.50
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Ely's B. E. 11 and larger	\$1.70 @ 1.75
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Ely's P. E. 12 to 20	\$3.00 @ 3.25
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**Ware Hollow—**

Stove Hollow Ware	
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Enameled	55¢ @ 60
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Ground	60¢ @ 65
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Plain or Unground	65¢ @ 70
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**Country Hollowware per 100 lbs., \$2.50**

White Enameled Ware	
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Maslin Kettles	700
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Covered Ware	
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Tinned and Turned	500
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Enamel	500
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See also Pots, Glue	
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**Enameled—**

Agate Nickel Steel Ware	50¢ @ 30
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Agate Nickel Steel Ware, Specials	60¢ @ 100
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Iron Clad Ware	70¢ @ 100
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Lava, Enameled	40¢ @ 100
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Never Break Enameled	500
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**Tea Kettles—**

Galvanized Tea Kettles	
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Inch	6 7 8 9
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Each	150 500 650 650
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**Steel Hollow Ware—**

Avery Spiders & Griddles	65¢ @ 65
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Very Kettles	300¢ @ 500
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Porcelain	500¢ @ 100
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Never Break Spiders and Griddles	65¢ @ 50
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Never Break Kettles	600
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Solid Steel Spiders & Griddles	65¢ @ 50
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Solid Steel Kettles	600
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**Warmers, Foot—**

Pike Mfg. Co., Soapstone	40¢ @ 40 @ 100
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**Washboards—**

Solid Zinc	7 doz
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Crescent, family size, bent frame	\$3.00
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Red Star, family size, stationary	3.00
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protector	\$3.00
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Double Zinc Surface	
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Saginaw Globe, family size, station-	
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ary protector	\$2.65
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Cable Cross, family size, stationary	2.65
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protector	\$2.90
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Single Zinc Surface	
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Salad, family size, open back perfor-	
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